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ABSTRACT

This document describes the operation and quality of pre-college instructional software sold for use on microcomputers. It also assists in locating other sources of similar information about instructional software. This edition is limited to programs for the Apple II, Commodore PET, and Radio Shack TRS-80 Model I. Fifty reviews of software products from 21 different suppliers are listed. In addition, an index is included which provides access to 287 reviews of instructional software published over the past two years by a dozen different magazines and journals. Also described is the User Software Review Program, a cooperative program through which persons interested in evaluating software may receive free or reduced price copies of School Microware Reviews. Advice is given on selecting software for review and on submitting evaluations. A copy of the evaluation form to be used is also provided. (LLS)

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Vol. 1, No. 1 SUMMER 1981

SCHOOL MICROWARE
REVIEWS

EVALUATIONS OF EDUCATIONAL SOFTWARE
for
APPLE, PET, TRS-80*

with index to evaluations in other publications

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STAFF

EDITOR AND PUBLISHER	Bob Haven
ART AND PRODUCTION	Mary Haven
DATA ENTRY/CLERICAL	Jacqueline Russell
OFFICE ASSISTANCE	Jennifer Haven

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FOREWORD

We at Dresden Associates want to express our gratitude to the persons who contributed material for the reviews included in this edition. We appreciate the time and energy they invested and hope that they will decide to submit material for future editions. Without help of this kind, SCHOOL MICROWARE REVIEWS cannot fulfill one of its major goals, which is to publish reviews based on information from those who really know what they're talking about, i.e., people who are actually using the software products in teaching and learning situations.

Our gratitude notwithstanding, the opinions expressed by these persons are their own and are not necessarily shared by Dresden Associates. Furthermore, Dresden Associates does not warrant or guarantee that any product reviewed here will operate exactly as described or that the educational results obtained by using the product will be the same as that found by our evaluators and described herein.

We also want to thank Inabeth Miller and the staff of the Gutman Library, Harvard Graduate School of Education, as well as Tim Barclay at Technical Education Research Centers, Cambridge, Mass., for their gracious assistance and use of their facilities while preparing the index to reviews in other publications. Finally, we thankfully acknowledge the help of Pamela Ellsworth, Tim Barclay, and Bonnie Turrentine in assigning weights to evaluation form items.

The microcomputer system names Apple, Atari, PET, and TRS-80 are used repeatedly throughout this volume. These names are the registered trademarks, respectively, of Apple Computer Company, Atari, Inc., Commodore Business Machines, and Tandy Corporation.

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INTRODUCTION

SCHOOL MICROWARE REVIEWS describes the operation and quality of pre-college instructional software sold for use on microcomputers. It also assists in locating other sources of similar information about instructional software. This edition is limited to programs for the Apple II, Commodore PET, and Radio Shack TRS-80 Model I (*), but future editions will contain reviews of software for other systems.

We intend to publish SCHOOL MICROWARE REVIEWS (SMW REVIEWS) at least twice a year, in Summer and Winter. It is a natural companion to our other publication, SCHOOL MICROWARE DIRECTORY, published in Fall and Spring, which boasts the largest available listing of educational software for microcomputers. Both of these publications are designed primarily for professional educators, but will be useful to anyone who wishes to use microcomputers for educational purposes.

RATIONALE

We believe that most persons involved in instructional applications of microcoputers will agree that the number one problem facing this field is software quality. A very important part of solving this problem is reviewing, evaluating, and reporting on the products that are being sold for instructional use. As more evaluative information becomes available, software developers will get a better idea of the standards which their products should meet. More importantly, users will learn to be more discriminating in purchasing software. As users begin buying only the better software, suppliers will be encouraged to provide higher quality materials. As we discuss in a succeeding section, this is a very big job, and one that needs the participation of SCHOOL MICROWARE readers.

ORGANIZATION

The balance of this edition comprises three main sections and an appendix. The Courseware Reviews section contains 50 reviews of software products from 21 different suppliers. The attempt is to include as many different suppliers and subject areas as possible.

The Index to Reviews in Other Publications provides access to 287 reviews of instructional software published over the past two years by a dozen different magazines and journals. This section will be updated in each edition of SMW REVIEWS.

The third main section of this volume describes our User Software Review Program. This is a cooperative program through which persons may receive SMW REVIEWS free or at reduced price in return for evaluating software. It is designed to provide the bulk of evaluative input for SMW REVIEWS. We had hoped to have a larger contribution from this program in the current edition, but did not receive enough material in time. We encourage anyone who is interested in doing evaluations to refer to the third section.

---

*APPLE, PET, and TRS-80 are registered trademarks, respectively, of Apple Computer Co., Commodore Business Machines, Inc., and Tandy Corp.

COURSEWARE REVIEWS

This section contains 50 reviews grouped by subject. They all were produced from completed evaluation forms of the type shown on page 59. They are presented in a format consisting of a heading, a functional description, and an evaluation. The heading contains identifying and purchasing information, and a summary rating. The latter is a single number in the range 1 to 10 and shown in the heading preceding a slash (/) and the number 10. It is computed from the ratings assigned by an evaluator to the individual items on the evaluation form. The computation procedure is described in Appendix A.

The functional description is an account of what a product does to achieve its goals. The evaluation is divided into comments and characteristics. The comments consist of whatever the evaluator felt was noteworthy about a given product. The characteristics subsection is a listing of descriptive items pertaining to the product. These are derived from the 0, 1, and 2 ratings assigned by the evaluator to items on the evaluation form (see App. A). They are grouped by the degree of criterion fulfillment into complete (++), partial (+), and minimal (-) categories.

TYPING TUTOR

Business: Typing
Grade Levels: 4 - 12

Practice touch typing
with speed monitoring.

Apple, TRS-80 Level II
Summary Rating: 8/10

Producer: Microsoft Consumer Products,
10800 N.E. 8th St., Bellevue, WA 98004
Tel: 206/454-1315.
Language: BASIC.

Equipment: 16K Apple or TRS-80 Level II, 32K with disk.
Packaging/price: One program $14.95 on cassette, $19.95 on disk.

FUNCTIONAL DESCRIPTION

Goals are to improve usage and knowledge and to increase the speed and accuracy of the typist. The student learns the keyboard in the approved manner. He or she may work on material presented as individual keystrokes or as paragraphs.

Student progress is shown at all times during the tutor mode. Approximately every ten lessons, the student may choose to proceed slower, faster, at the same speed, or to try a paragraph. The program times the typing of a paragraph and reports the number of missed keystrokes, the keys on which the user was fast or slow, the speed in words per minute, and the number of errors.

EVALUATION

COMMENTS

This is an outstanding program. Response time is very fast. Many students have come in on their own to try it (as well as those who were assigned). Response from the typing teachers is excellent. No bugs or problems are evident. However, I believe that the program should allow experienced users to skip instructions, which it does not. I would recommend the disk version due to the slower loading time of the cassette.

CHARACTERISTICS

o Documentation

(++) Includes operating instructions*. Documentation is written clearly*.

(-) Does not include listing and sample run of program, which probably is unnecessary.

o Instructions Given to User by Program

(++) Adequate instructions are given regarding the instructional task. Complete instructions are given regarding interacting with the program*.

(-) The user may not skip instructions if already known.

o Student-Computer Dialog

(++) Output is paged. User controls continuing to the next page. Appropriate amount of information in each page. Perceptual impact of information presented is suitable. Output spaced and formatted well. Language is well suited to most students' reading abilities. Uses correct grammar, spelling, hyphenation, and punctuation*. Student may respond with common symbols and ways of using them. Provides well for individual needs*. Reinforcing responses are quite appropriate. Allows a reasonable number of wrong answers. Includes good provisions for giving help if difficulty is encountered*. Deals quite well with inappropriate entries*. All required entries are within student capabilities*. Good reporting of student performance.

(+) Fair use of sound.

(-) Dialog is not personalized. Does not use devices to get and maintain interest. Color (on Apple) and graphics are not used.

o Miscellaneous Concerns

(++) Prerequisite concepts and vocabulary are quite reasonable. Operates properly and is free of bugs*.

---

* Good implementation of the feature referred to is considered essential for effective courseware.

Evaluative information provided by
Randall English, Librarian, Beecher High School, Flint, Michigan.

ARISTOTLE'S APPLE

All Departments and Subjects
Grade Levels: 1 - 12

Facilitates preparation of
drill/practice and tests.

Apple
Summary Rating: 8/10

Producer: Stoneware Microcomputer Products, 1930 Fourth St., San Rafael, CA 94901, Tel: 415/454-6500.
Language: Applesoft BASIC.

Equipment: 48K Apple with disk.
Packaging/price: On disk, $34.95.

FUNCTIONAL DESCRIPTION

Allows a teacher to easily create drill/-practice programs and tests. Created materials may be in three formats: fill-in, multiple choice, and column matching. Can be used in all areas not requiring special characters and symbols, e.g., it is not good for certain foreign languages. It includes a tutor-test section which can serve as an introduction to the program for the teacher.

EVALUATION

COMMENTS

This program is recommended highly. It is very easy to use by both teacher and student. One minor limitation: Matching items are restricted to 10 blanks. The documentation is quite adequate. The created material can be semi-locked, allowing access to only those students/users with the proper code. Back-up copies of the program disk are allowed.

CHARACTERISTICS

o Documentation

(++) Includes suggested course/subject and grade levels, prerequisites for use of the program, and operating instructions*. Documentation is written clearly*.

o Instructions Given to User by Program

(++) Adequate instructions are given regarding the instructional task. Complete instructions are given regarding interacting with the program*. The user may skip instructions if already known.

o Student-Computer Dialog

(++) Output is paged. Appropriate amount of information in each page. Perceptual impact of information presented is suitable. Output spaced and formatted well. Language is well suited to most students' reading abilitities. Uses correct grammar, spelling, hyphenation, and punctuation*. Student may respond with common symbols and ways of using them. Good use of devices such as objective formats to minimize bad entries. Good reporting of student performance.

(+) User has partial control over continuing to the next page.

(-) Does not accept abbreviations for common responses. Color, graphics, and sound are not used. Gives no opportunity to get help if difficulty is encountered*.

o Miscellaneous Concerns

(++) Prerequisite concepts and vocabulary are quite reasonable. Operates properly and is free of bugs*. Program is well structured and documented internally.

---

* Good implementation of the feature referred to is considered essential for effective courseware.

Evaluative information provided by Randall English,
Librarian, Beecher High School, Flint, Michigan.

. . . .

TAKE IT (continued from page 33)

(+) Amount of information in each page is more or less appropriate, except in instructions.

(-) Does not use devices to get and maintain interest. Makes poor use of graphics, color, and sound.

o Miscellaneous Concerns

(++) Prerequisite concepts and vocabulary are quite reasonable. Operates properly and is free of bugs*. Program is well structured and documented internally.

---

* Good implementation of the feature referred to is considered essential for effective courseware.

Evaluative information provided by Dresden Associates.

YELLOW LIGHT

Driver Education
Grade Levels: 7 - 12

PET
Summary Rating: 5/10

Students experiment with traffic light and road intersection characteristics.

Supplier: National Coordinating Center for Curriculum Development, State University of New York, Stony Brook, NY 11794
Tel: 516/246-8418.
Language: BASIC.

Equipment: 8K PET or 32K PET with disk.
Packaging/price: Individually on cassette, $5; in package of 15 programs, $50. Also on disk.

FUNCTIONAL DESCRIPTION

This simulation allows students to: (1) experiment with various characteristics of a road intersection having a traffic light; and (2) to determine its safety. The factors which may be varied are intersection width, speed limit, yellow light duration, driver's reaction time and deceleration rate. The program first determines the student's time to react to a yellow light as he or she views a car approaching an intersection. Then, it simulates situations defined by the student and computes the "dilemma zone" for each one. The dilemma zone is the zone in which it is neither safe to go nor to stop. The student may attempt to minimize the dilemma zone by altering intersection characteristics.

EVALUATION

COMMENTS

Rather dull. I can't imagine doing it more than once.

CHARACTERISTICS

o Documentation

The only documentation is a short description of goals and of what the program does. The latter gives some operating instructions.

o Instructions Given to User by Program

(+) Instructions regarding the instructional task are fair. Partial instructions are given regarding interacting with the program*.

(-) The user may not skip instructions if already known.

o Student-Computer Dialog

(++) Output is paged. User controls continuing to the next page. Uses correct grammar, spelling, hyphenation, and punctuation*. Student may respond with common symbols and ways of using them. Reinforcing responses are quite appropriate. All required entries are within student capabilities*. Good reporting of student performance.

(+) Amount of information in each page is fairly appropriate. Perceptual impact of information presented is more or less suitable. Output spaced and formatted moderately well. Language is fairly well suited to most students' reading abilities. Makes moderate use of graphics. Responds fairly well to excessive wrong answers*.

(-) Does not accept abbreviations for common responses. Does not provide for individual needs*. Dialog is not personalized. Does not use devices to get and maintain interest. Gives no opportunity to get help if difficulty is encountered*. No use of devices to minimize bad entries. Does not deal well with inappropriate entries.

o Miscellaneous Concerns

(++) Prerequisite concepts and vocabulary are quite reasonable.

(+) Gives a fairly accurate representation of the situation simulated. Operates fairly well (contained a minor bug)*.

---

* Good implementation of the feature referred to is considered essential for effective courseware.

Evaluative information provided by Bonnie Turrentine,
Math Teacher, Dedham High School, Dedham, Massachusetts.

ADJECTIVE RECOGNITION

English: Grammar
Grade Levels: 4 - 7

Practice recognizing adjectives in sentence context.

Apple, TRS-80
Summary Rating: 6/10

Supplier: Micro Learningware, P.O. Box 2134, N. Mankato, MN 56001 Tel: 507/-625-2205.
Language: Level II or Applesoft BASIC.

Equipment: 16K TRS-80 or Apple with recorder, 32K with disk.
Packaging/price: Cassette or disk; $7.95 individually, $24.95 in 6-program package.

FUNCTIONAL DESCRIPTION

The program displays a sentence, then places its first word in a box. The student moves words of the sentence through the box until he or she recognizes an adjective, then presses Enter to indicate recognition. If the word is an adjective, a robot shape on screen nods Yes, and the program goes on to another sentence. If the response is incorrect, the robot nods in the negative, and the student continues searching. The program gives unlimited trials. Performance is reported after completing the requested number of sentences.

EVALUATION

COMMENTS

This is not a very effective program. Its main strength is giving young non-tyists full control over the exercise with only two keys. The following shortcomings are the most important: (1) minimum documentation (15 lines); (2) instructions given by the program are hard to read and understand; (3) no variation in format and response, or personalization, making dialog monotonous after a while; (4) no facilities to give easier or harder material to meet individual needs; (5) unlimited wrong answers; (6) no opportunity to get help if it is needed; (7) no periodic reporting of performance to add incentive; (8) poor screening of irrelevant entries; and (9) the program takes too long to recognize entries, a confusing situation for young users.

CHARACTERISTICS

o Documentation

(++) Includes goals statement and operating instructions*. Documentation is written clearly*.

(-) Does not include suggested course/-subject and grade levels, performance objectives, suggested teaching strategies, correlation with standard texts, prerequisites for use, listing and sample run of program, and suggested follow-up references/activities.

o Instructions Given to User by Program

(++) Adequate instructions are given regarding interacting with the program* and regarding the instructional task.

(-) The user may not skip instructions.

o Student-Computer Dialog

(++) Output spaced and formatted well. Language is well suited to most students' reading abilities. Uses correct grammar, spelling, hyphenation, and punctuation*. Student may respond with common symbols. Reinforcing responses are appropriate. Good use of devices such as objective formats to minimize bad entries. All required entries are within student capabilities*.

(+) More or less adequate use of devices to maintain interest. Makes some use of graphics. Fair reporting of student performance.

(-) Does not provide for individual needs*. Dialog is not personalized. Number of errors allowed is unreasonable. Gives no opportunity to get help if difficulty is encountered*. Deals poorly with inappropriate entries*.

o Miscellaneous Concerns

(++) Prerequisite concepts and vocabulary are quite reasonable. Operates properly*.

(-) Program is not well structured and documented internally.

---

* Good implementation of the feature referred to is considered essential for effective courseware.

Evaluative information provided by Dresden Associates.

AGREEMENT OF SUBJECT AND VERB

English: Grammar
PET
Grade Levels: 3 - 6
Practice selecting correct verb form - game format.
Summary Rating: 7/10

Supplier: Micro-Ed, P.O. Box 24156, Minneapolis, MN 55424 Tel: 612/926-2292.
Language: BASIC.

Equipment: 8K PET.
Packaging/price: On cassette, $7.95.

FUNCTIONAL DESCRIPTION

The program presents a sentence containing a blank in place of the verb; it also displays two choices of verb to complete the sentence and asks the student for his choice. Two locomotives, one belonging to the student, the other the computer's, are displayed. Each time the student answers correctly, his or her locomotive is advanced. On incorrect responses, the computer's machine is moved. At the end of a session, the program reports the number of problems done, the number of errors, and the elapsed time.

EVALUATION

COMMENTS

This is a fairly adequate program. Its major strengths are the use of the locomotives (nice graphics) to maintain interest and as an incentive to try harder.

The following improvements should be considered: (1) Documentation should be augmented considerably (see below under Characteristics); (2) provisions should be included for adjusting to individual student needs (and to facilitate teacher entry of different words); (3) the program should filter out irrelevant type-ins, - also helpful would be the use of a multiple-choice format for questions to minimize bad entries; and (4) the program should be structured and commented to facilitate tailoring and modification.

CHARACTERISTICS

o Documentation

(++) Includes goals statement. Documentation is written clearly*.

(-) Does not include suggested course/-subject and grade levels, stated performance objectives, suggested teaching strategies, correlation with standard tests, prerequisites for use of the program, operating instructions*, listing and sample run of program, and suggested follow-up references/activities.

o Instructions Given to User by Program

(++) Adequate instructions are given regarding interacting with the program* and regarding the instructional task. The user may skip instructions.

o Student-Computer Dialog

(++) Output is paged. User controls continuing to the next page. Appropriate amount of information in each page. Perceptual impact of information presented is suitable. Output spaced and formatted well. Language is well suited to most students' reading abilities. Uses correct grammar, spelling, hyphenation and punctuation*. Student may respond with common symbols and ways of using them. Accepts abbreviations for common responses. Makes good use of devices to get and maintain interest, including graphics. Reinforcing responses are quite appropriate. Allows a reasonable number of wrong answers. Responds appropriately to excessive wrong answers*. All required entries are within student capabilities*. Good reporting of student performance.

(-) Does not provide for individual needs*. Dialog is not personalized. Gives no opportunity to get help if difficulty is encountered*. Does not use objective format to minimize inappropriate entries. Deals poorly with inappropriate entries*.

o Miscellaneous Concerns

(++) Prerequisite concepts and vocabulary are quite reasonable. Operates properly and is free of bugs*.

(-) Program is not well structured and documented internally.

---

* Good implementation of the feature referred to is considered essential for effective courseware.

Evaluative information provided by Dresden Associates.

CODE BREAKER

English: Vocabulary, Grammar
Grade Levels: 4 - 9

Improve word handling
skills in game format.

Apple, PET, TRS-80
Summary Rating: 6/10

Producer: Program Design, Inc., 11 Idar Court, Greenwich, CT 06830, Tel: 203/-661-8799.
Language: BASIC.

Equipment: 16K Apple or TRS-80 Level II; 8K PET; 32K Apple with disk.
Packaging/price: Three programs; $16.95 on cassette, $21.95 on Apple disk.

FUNCTIONAL DESCRIPTION

Scrambled message games designed to improve word handling skills. At the beginning level, a simple nonsense sentence is shown, but each word is scrambled, e.g., TCA for CAT. At the advanced level, not only the word is scrambled, but the grammar as well, e.g., verbs and adverbs may be exchanged, etc. The object is to break the code. The user may try as often as he/she likes.

EVALUATION

COMMENTS

The stated aim is to improve vocabulary and learn different sentence patterns. I doubt if it accomplishes this. The game aspect predominates. This company's other materials are quite good, but I would rate this only average as an educational product.

CHARACTERISTICS

o Documentation

(++) Includes operating instructions*. Documentation is written clearly*.

(+) Partially fulfills the need for suggested course, subject and grade level.

(-) Does not include stated goals, performance objectives, teaching strategies, and listing and sample run of programs.

o Instructions Given to User by Program

(++) Adequate instructions are given regarding the instructional task. Complete instructions are given regarding interacting with the program*.

(-) The user may not skip instructions if already known.

o Student-Computer Dialog

(++) Output is paged. Appropriate amount of information in each page. Perceptual impact of information presented is suitable. Output spaced and formatted well. Language is well suited to most students' reading abilities. Uses correct grammar, spelling, hyphenation, and punctuation*. Allows a reasonable number of wrong answers. Includes good provisions for giving help if difficulty is encountered*. Deals quite well with inappropriate entries*. All required entries are within student capabilities*.

(+) Fair reporting of student performance.

(-) User has limited control over continuing to the next page. Does not accept abbreviations for common responses. Does not provide for individual needs*. Dialog is not personalized. Does not use devices to get and maintain interest. Makes poor use of graphics. Color and sound are not used. Reinforcing responses are inappropriate. Responds inappropriately to excessive wrong answers*. No use of devices to minimize bad entries.

o Miscellaneous Concerns

(++) Prerequisite concepts and vocabulary are quite reasonable. Operates properly and is free of bugs*.

---

* The feature referred to is considered essential for effective courseware.

Evaluative information provided by Randall English,
Librarian, Beecher High School, Flint, Michigan.

COMMA

English: Grammar
PET
Grade Levels: 4 - 8
Game involving comma usage in sentences.
Summary Rating: 6/10

Supplier: Teacher's PET (Glenn Fisher),
1517 Holly St., Berkeley, CA 94703.
Language: BASIC.

Equipment: 8K PET.
Packaging/price: On cassette, $7.95.

FUNCTIONAL DESCRIPTION

This is a multi-player game. A player must decide whether or not a comma should follow a given word in a sentence. The student answers Yes or No. On the student's first error, the program gives a set of usage rules (and scores the answer as wrong). On the second incorrect answer, it allows another trial. If still in error, the next student is given a turn on a new sentence. Provisions are included for the teacher to enter different sentences. The program reports a player's score after his or her turn and the over-all standings at the end.

EVALUATION

COMMENTS

This program is barely adequate. Its only redeeming features are the game format and the attempt at giving help by displaying a set of usage rules. It could be improved by correcting the following shortcomings: Documentation is limited to a single paragraph. There are several misspelled words and some poor spacing and punctuation in the rules given by the computer. The program allows three chances to get a problem right even though there are only two choices, Yes or No. Also, using the sentences included in the program, the student can get a fairly good score just by entering No every time - the examples are not well balanced. The game does not include any surprise or change of pace, etc. to hold interest. It does not deal well with inappropriate entries - it doesn't even check to see if a response is other than Yes or No.

CHARACTERISTICS

o Documentation

(++) Includes goals statement. Documentation is written clearly*.

(-) Does not include suggested course/subject and grade levels, performance objectives, suggested teaching strategy, correlation with standard texts, prerequisites for use, operating instructions*, listing and sample run of program, and suggested follow-up references/activities.

o Instructions Given to User by Program

(++) Adequate instructions are given regarding interacting with the program* and regarding the instructional task. The user may skip instructions.

o Student-Computer Dialog

(++) Output is paged. User controls continuing to the next page. Appropriate amount of information in each page. Perceptual impact of information presented is suitable. Output spaced and formatted well. Language is well suited to most students' reading abilities. Student may respond with common symbols. Accepts abbreviations for common responses. Dialog is personalized. Reinforcing responses are appropriate. Responds appropriately to excessive errors*. Good use of devices such as objective formats to minimize bad entries. All required entries are within student capabilities*. Good reporting of student performance.

(+) Makes fair use of graphics. Includes moderate provisions for giving help if difficulty is encountered*.

(-) Uses poor grammar, spelling, hyphenation, or punctuation*. Does not use devices to maintain interest. Number of errors allowed is unreasonable. Deals poorly with inapproprate entries*.

o Miscellaneous Concerns

(++) Prerequisite concepts and vocabulary are quite reasonable. Operates properly*.

(+) Program is fairly well structured and documented internally.

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* Good implementation of the feature referred to is considered essential for effective courseware.

Evaluative information provided by Dresden Associates.

READINGS IN LITERATURE

English: Literature
Grade Levels: 10 - 12

Familiarizes students with
well-known literary passages.

Apple
Summary Rating: 8/10

Supplier: George Earl, 1302 So. General McMullen, San Antonio, TX 78237.
Language: Applesoft BASIC.

Equipment: 32K Apple with disk.
Packaging/price: On disk, $29.95

FUNCTIONAL DESCRIPTION

Contains 27 well-known passages from English literature, including Shakespeare plays, political treatises, songs, and poems. Two modes are provided: (1) familiarization; and (2) quiz. In the first mode, the program presents two lines of text at a time with one word left out in the second line; a large color-graphic display is shown above the text. The student responds with the first letter of the missing word. If he or she is wrong, the program goes into "Hangman" mode for three tries at finding the missing word by guessing letters. On each turn, the graphic display shrinks, this accompanied by appropriate sad sounds. If the word is entered correctly, the program gives positive feedback, then drops the line just covered and shows the next one, thus previewing a line before having to identify a word in it. Quiz mode is similar except only one line is presented at a time (no preview). A performance report is given after both familiarization and quiz. There is a periodic review of lines missed.

EVALUATION

COMMENTS

This is a good way to familiarize unmotivated students with passages; it is unique, fun, and interesting. The most attractive features are excellent instructions in the program; a good hint facility; and attractive color graphics and sound.

The greatest deficiency in the program is that the presentation mode and periodic line reviews are very disruptive to the over-all continuity and integration of the passage being studied. Thus, use of the program definitely should be accompanied by reading the entire passage either before or after in order to get the "big picture" and to understand the flow.

The accompanying documentation should be expanded to include the items noted below under Characteristics. Also, it should include instructions for building one's own text files. (The program is protected from access, so one cannot easily determine how to do this - or modify the program, for that matter.)

In other areas, the presentation format is always the same (although a very interesting format), and the program evaluates illogical entries (e.g., numbers) as errors. Finally, the dialog could use some breaks, e.g., periodic performance reports, to keep long passages from getting monotonous.

CHARACTERISTICS

o Documentation

(++) Includes goals statement and operating instructions*. Documentation is written clearly.

(+) Partially fulfills the need for suggested course/subject and grade levels.

(-) Does not include: stated performance objectives, suggested teaching strategies, correlation with standard texts, prerequisites for use of the program, student exercises and answers, listing and sample run of program, suggested follow-up discussion topics and references/activities.

o Instructions Given to User by Program

(++) Adequate instructions are given regarding the instructional task and interacting with the program*.

(-) The user may not skip instructions if already known.

o Student-Computer Dialog

(++) Output is paged. User controls continuing to the next page. Appropriate amount of information in each page. Perceptual impact of information presented is suitable. Output spaced and formatted well. Language is well suited to most students' reading abilities. Uses correct

(continued on page 54)

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* Good implementation of the feature referred to is considered essential for effective courseware.

COMPU-READ

English: Reading
Grade Levels: 3 - 12

Several programs to improve comprehension and retention.

Apple
Summary Rating: 7/10

Supplier: Edu-Ware Services, 22222 Sherman Way-Suite 102, Canoga Park, CA 91303
Tel: 213/346-6783.
Language: Applesoft BASIC.

Equipment: 48K Apple with disk drive.
Packaging/price: On disk, $24.95.

FUNCTIONAL DESCRIPTION

Includes four programs: Character Recognition flashes groups of three letters at a chosen speed; the student tries to duplicate them. If successful, the program reports this and the speed; the speed is increased on the next trial. If an answer is not correct, the program repeats the letters and goes on to the next item. High-Speed Word Recognition is similar to the first program except that it uses full words. Synonyms and Antonyms flashes a word and possible synonyms and antonyms; the object is to type in the correct synonym. Sentence Comprehension flashes a sentence and asks a question about the information contained. If the answer is correct, the program acknowledges and goes to the next sentence; if not it gives the correct answer before proceeding. All four programs include speed selection by user, automatic speed change based on performance, and performance reports after each item and at session end.

EVALUATION

COMMENTS

This is a fairly effective package of programs. It represents a good application of the computer to the educational process. The documentation, although incomplete, is well done. All of the programs adjust difficulty level based on performance. The second program allows use of one's own words.

The programs would be much more effective if the following deficiences were corrected: The instructions given by the programs contain more information than would be suitable for students, also some ungrammatical sentences. Typing mistakes cannot be corrected. Objective formats are not used to minimize bad entries and to reduce ambiguities in questions; this would be especially important in the Synonyms/Antonyms and Sentence Comprehension programs. Within a given program, there is no variation in presentation or response, no change in pace, etc., no use of graphics and sound - improvements in these areas would make the program more suitable for young learners. And finally, with these programs, one must use a well-adjusted video monitor or it will be difficult to see the words presented at high speed.

CHARACTERISTICS

o Documentation

(++) Includes goals statement and operating instructions*. Documentation is written clearly*.

(+) Partially fulfills the need for suggested course/subject and grade levels.

(-) Does not include performance objectives, suggested teaching strategies, correlation with standard texts, prerequisites for use, listings and sample runs of programs, and suggested follow-up references/activities.

o Instructions Given to User by Programs

(++) Complete instructions are given regarding interacting with the programs*. The user may skip instructions.

(+) Instructions regarding the instructional tasks are fair.

o Student-Computer Dialog

(++) Output is paged. Output spaced and formatted well. Language is well suited to most students' reading abilities. Student may respond with common symbols. Provides for individual needs*. Reinforcing responses are appropriate. Allows a reasonable number of errors. Responds appropriately to excessive errors*. All required entries are within student capabilities*. Good reporting of student performance.

(+) Amount of information in each page is fairly appropriate. Perceptual impact of information presented is more or less suitable. Uses mostly correct grammar,

(continued on page 52)

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* Good implementation of the feature referred to is considered essential for effective courseware.

CUB REPORTER

English: Reading
Grade Levels: 3 - 6

Student plays reporter to practice reading comprehension.

TRS-80
Summary Rating: 5/10

Supplier: Jensen Software, 1589 Blossom Park, Lakewood, OH 44107.
Language: Level II BASIC.

Equipment: 16K TRS-80 Model I.
Packaging/price: On cassette, $9.95.

FUNCTIONAL DESCRIPTION

This program has the user, in the role of cub reporter, go to a murder scene. The situation is described in play format. Then, the student answers about eight multiple-choice questions about the situation. After a correct answer, the program presents the next item. It responds to a wrong answer by giving the correct one and then proceeds to the next question. A performance report is given at the end of the session.

EVALUATION

COMMENTS

The general concept of this program is attractive, but it is poorly implemented. The documentation, consisting of only a six-line description of what the program does, should be augmented considerably. No instructions are given, either in the flyer or by the program, on how to terminate responses. Too much information is presented in each page - it should be broken up. The single wrong answer allowed for each question could be increased to two. Student entries should be checked for irrelevant characters - the program does not do this. And finally, the program contains no facilities for helping students who are having difficulty or for changing difficulty levels depending upon student performance.

CHARACTERISTICS

o Documentation

(++) Includes goals statement and operating instructions*. Documentation is written clearly*.

(-) Does not include suggested course/-subject and grade levels, stated performance objectives, suggested teaching strategies, correlation with standard texts, prerequisites for use of the program, listing and sample run of program, and suggested follow-up references/activities.

o Instructions Given to User by Program

(++) Adequate instructions are given regarding the instructional task.

(+) Partial instructions are given regarding interacting with the program*.

(-) The user may not skip instructions if already known.

o Student-Computer Dialog

(++) Output is paged. User controls continuing to the next page. Output spaced and formatted well. Language is well suited to most students' reading abilities. Uses correct grammar, spelling, hyphenation, and punctuation*. Student may respond with common symbols and ways of using them. Makes good use of graphics. Reinforcing responses are quite appropriate. Responds appropriately to excessive wrong answers*. Good use of devices such as objective formats to minimize bad entries. All required entries are within student capabilities*. Good reporting of student performance.

(+) Amount of information in each page and perceptual impact of information presented are more or less appropriate.

(-) Dialog is not personalized. Does not use devices to get and maintain interest. Number of wrong answers allowed is unreasonable. Gives no opportunity to get help if difficulty is encountered*. Deals poorly with inappropriate entries*.

o Miscellaneous Concerns

(++) Prerequisite concepts and vocabulary are quite reasonable. Operates properly and is free of bugs.

(-) Program is not well structured and documented internally.

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* Good implementation of the feature referred to is considered essential for effective courseware.

Evaluative information provided by Dresden Associaties.

LEARN TO READ

English: Reading
Grade Levels: 1 - 3

Drill involving matching
words and pictures.

TRS-80
Summary Rating: 6/10

Supplier: Jensen Software, 1589 Blossom Park, Lakewood, OH 44107.
Language: Level II BASIC.

Equipment: 16K TRS-80 Model I.
Packaging/price: On cassette, $9.95.

FUNCTIONAL DESCRIPTION

The student is given a sheet containing 20 numbered, small pictures. The program presents a three-letter word, and the student enters the number of the picture corresponding to the word. If the answer is correct, the next word is presented. If it is in error, the right answer is given, and the next word is presented. The program reviews the words that were missed until all have been correctly matched. A performance report is given at session end.

EVALUATION

COMMENTS

This program is barely adequate, but could be used in some situations. Its strongest features are immediate feedback and repetition until all words are learned.

Some of the more important candidates for improvement are the following: (1) documentation is limited to a four-line paragraph; (2) some of the numerical designations on the sheet of pictures are improperly located, making their pairing with the pictures unclear; (3) neither graphics nor any device to get and maintain interest is used, making the over-all effect fairly dull; (4) irrelevant entries are not filtered out; (5) the only indication of a right answer is going on to the next problem; (6) there are no provisions for adjusting to individual needs, e.g. by giving easier or harder words, etc.; and (7) there are no periodic performance reports to provide reinformcement/incentive.

CHARACTERISTICS

o Documentation

(++) Includes goals statement and suggested teaching strategy. Documentation is written clearly*.

(-) Does not include suggested course/subject and grade levels, performance objectives, correlation with standard texts, prerequisites for use, operating instructions*, listing and sample run of program, and suggested follow-up references/activities.

o Instructions Given to User by Program

(++) Adequate instructions are given regarding the instructional task.

(-) Instructions regarding interacting with the program are inadequate*. The user may not skip instructions.

o Student-Computer Dialog

(++) Output is paged. Appropriate amount of information in each page. Perceptual impact of information presented is suitable. Output spaced and formatted well. Language is well suited to most students' reading abilities. Uses correct grammar, spelling, hyphenation, and punctuation*. Student may respond with common symbols. Accepts abbreviations for common responses. Allows a reasonable number of errors. Responds appropriately to excessive errors*. Good use of devices such as objective formats to minimize bad entries. All required entries are within student capabilities*.

(+) Includes more or less adequate provisions for giving help if difficulty is encountered*. Fair reporting of performance.

(-) User has limited control over continuing to the next page. Does not provide for individual needs*. Dialog is not personalized. Does not use devices to maintain interest. No use of graphics. Reinforcing responses are inappropriate. Deals poorly with inappropriate entries*.

o Miscellaneous Concerns

(++) Prerequisite concepts and vocabulary are quite reasonable. Operates properly.

(-) Program is not well structured and documented internally.

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* Good implementation of the feature referred to is considered essential for effective courseware.

Evaluative information provided by Dresden Associates.

PERSON, PLACE, OR THING

English: Grammar
Grade Levels: 3 - 6

Drill on identifying noun types.

Apple, TRS-80
Summary Rating: 5/10

Supplier: Micro Learningware, P.O. Box 2134, N. Mankato, MN 56001 Tel: 507/-625-2205.
Language: Applesoft and Level II BASIC.

Equipment: 16K TRS-80 or Apple with recorder, 32K with disk.
Packaging/price: Cassette or disk; $7.95 alone, $24.95 in six-program package.

FUNCTIONAL DESCRIPTION

The program places a noun in one of three boxes labeled Person, Place, and Thing. The student moves the word to the box giving the word's correct category by pressing the space bar and then presses Enter. The student's choice is reported as correct or incorrect. If correct, the program presents a new word. If incorrect, the student tries again (no limit on tries). Nouns are chosen randomly from a list of 40 stored in the program. Performance is reported at the end of the session.

EVALUATION

COMMENTS

The only documentation is a paragraph in a promotional flyer. The program is very simple and uninteresting. There is nothing personal or fun about it, and it's not at all challenging.

If the student is having trouble, he or she can continue indefinitely selecting the wrong answer. There should be a limit on the number of incorrect responses before going to a new problem or terminating the program.

The program uses the Enter key in a confusing manner. The student is told to press it when a noun is in the proper category box. The Enter key also is used to indicate readiness for a new problem. Separate keys should be used for these two functions.

The program does not operate as specified. Instead of accepting only the Enter key to indicate the student's answer, the program assumes that ANY key except the space bar and Break has this significance. Thus, if the student accidentally presses a number key at the wrong moment, he gets an "incorrect" answer tallied. Also the Enter key does not always work to identify the student's answer - sometimes, it moves the word.

CHARACTERISTICS

o Documentation

The only documentation provided is a paragraph describing what the program does.

o Instructions Given to User by Program

(++) Adequate instructions are given regarding the instructional task. Complete instructions are given regarding interacting with the program*.

(-) The user may not skip instructions if already known.

o Student-Computer Dialog

(++) Output is paged. User controls continuing to the next page. Appropriate amount of information in each page. Perceptual impact of information presented is suitable. Output spaced and formatted well. Language is well suited to most students' reading abilities. Uses correct grammar, spelling, hyphenation, and punctuation*. The coordinate system used is consistent with common conventions. Reinforcing responses are quite appropriate. Allows a reasonable number of wrong answers. All required entries are within student capabilities*.

(+) Makes fair use of graphics. More or less adequate reporting of student performance.

(-) Does not provide for individual needs*. Dialog is not personalized. Does not use devices to get and maintain interest. Gives no opportunity to get help if difficulty is encountered*. No use of devices to minimize bad entries. Deals poorly with inappropriate entries*.

o Miscellaneous Concerns

(++) Prerequisite concepts and vocabulary are quite reasonable.

(+) Operates fairly well*.

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* Good implementation of the feature referred to is considered essential for effective courseware.

Evaluative information provided by
Evelyn Anderson (former teacher), Portland, Maine.

PERSON, PLACE OR THING

English: Grammar
Grade Levels: 3 - 6

Practice identifying nouns as to type.

Apple, TRS-80
Summary Rating: 5/10

Supplier: Micro Learningware, P.O. Box 2134, N. Mankato, MN 56001 Tel: 507/-625-2205.
Language: Applesoft and Level II BASIC.

Equipment: 16K TRS-80 or Apple with recorder, 32K with disk.
Packaging/price: Cassette or disk; $7.95 alone, $24.95 in six-program package.

FUNCTIONAL DESCRIPTION

The student tries to categorize up to 40 nouns. The program displays three boxes labelled Person, Place, and Thing. A noun is placed randomly in one of the three boxes. The student may move it from box to box by pressing the Space bar. The correct box is indicated by pressing Enter. If the answer is correct, the program presents a new noun. If not, the program indicates a wrong answer and the child tries some more (unlimited trials). Performance is reported after all words have been categorized.

EVALUATION

COMMENTS

This is not a very effective program. Its one good feature is the use of the boxes and single key controls to manipulate entire words, thus allowing young children with no typing skills to easily interact with it.

The following deficiencies should be corrected: (1) documentation limited to a single paragraph; (2) no devices to get and maintain interest - dialog not personalized; (3) no provision for individual needs; (4) unlimited wrong answers; (5) no opportunity to get help; (6) no periodical report of student performance; and (7) no structuring/comments in program. Also, there seems to be a bug in the response-processing logic. One can get a right answer every time merely by hitting several keys at random. Finally, some of the words included in the list could go in more than one category.

CHARACTERISTICS

o Documentation

(++) Includes operating instructions*. Documentation is written clearly*.

(-) Does not include suggested course/-subject and grade levels, goals and performance objectives, teaching strategies, correlation with standard texts, prerequisites for use, listing and sample run of program, and suggested follow-up references/activities.

o Instructions Given to User by Program

(++) Adequate instructions are given regarding the instructional task.

(-) Instructions regarding interacting with the program are inadequate*.

o Student-Computer Dialog

(++) Output spaced and formatted well. Language is suited to most students'reading abilities. Uses correct grammar, spelling, hyphenation, and punctuation*. Student may respond with common symbols. Good use of objective format to minimize bad entries. Reinforcing responses are appropriate. All required entries are within student capabilities*.

(+) Makes some use of graphics. More or less adequate reporting of student performance.

(-) Does not provide for individual needs*. Dialog is not personalized. Does not use devices to maintain interest. Number of errors allowed is unreasonable. Gives no opportunity to get help if difficulty is encountered*. Deals poorly with inappropriate entries*.

o Miscellaneous Concerns

(++) Prerequisite concepts and vocabulary are quite reasonable. Operates properly*.

(-) Program is not well structured and documented internally.

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* Good implementation of the feature referred to is considered essential for effective courseware.

Evaluative information provided by Dresden Associates.

English: Reading
Grade Levels: 2 - 12

SPEED READING AND COMPREHENSION

Practice reading text passages,
followed by comprehension tests.

PET
Summary Rating: 8/10

Supplier: Abbott Educational Software,
334 Westwood Ave., East Longmeadow, MA
01028.
Language: BASIC.

Equipment: 16K PET.
Packaging/Price: Six programs on cassettes $49.95, or disk $59.95.

FUNCTIONAL DESCRIPTION

Three reading practice programs, a text file builder, and a text file corrector. All three practice programs are different in presentation mode, but follow the same over-all procedure: First, a rapid scan of a text passage is given, followed by a line-by-line presentation of the same text for reading, and finally by a multiple-choice quiz to measure comprehension. The presentation modes are as follows: READA presents four text lines at a time, dropping the first one as a new one is brought on at the bottom; READB presents one line at a time, blanking out the line from left to right at the current reading speed; and READC is the same as READB with no blanking. The speed of text presentation may be increased or decreased by the reader while reading is going on and without stopping the program. All practice programs report the reader's speed and comprehension level at the end of a session. File builder and corrector programs allow the teacher to enter text passages for presentation by the READ programs.

EVALUATION

COMMENTS

An unusual approach to solving an important problem; could be given a lighter and more interesting framework, but in general is a good job. Important deficiencies are the absence of performance objectives and the lack of user proofing (doesn't filter out illogical carries, STOP key, etc.). Attractive features are good documentation; upper and lower-case presentation; real-time control of presentation speed; and provisions for teacher entry of own text passages.

CHARACTERISTICS

o Documentation

(++) Includes goals statement. Includes operating instructions* and documentation is written clearly*.

(+) Partially fulfills the need for suggested course/subject/grade levels, and listing and sample run of programs.

(-) Does not include stated performance objectives, correlation with standard texts, and suggested follow-up references/activities.

o Instructions Given to User by Program

(++) Adequate instructions are given regarding the instructional task. Complete instructions are given regarding interacting with the program*.

(-) The user may not skip instructions if already known.

o Student-Computer Dialog

(++) Output is paged. User controls continuing to the next page. Appropriate amount of information in each page. Perceptual impact of information presented is suitable. Output spaced and formatted well. Language is well suited to most students' reading abilities. Uses correct grammar, spelling, hyphenation, and punctuation*. Student may respond with common symbols and ways of using them. Provides well for individual needs*. Responds appropriately to excessive wrong answers*. Good use of devices such as objective formats to minimize bad entries. All required entries are within student capabilities*.

(+) Fair reporting of student performance.

(-) Dialog is not personalized. Does not use devices to get and maintain interest. Reinforcing responses are inappropriate. Number of wrong answers allowed is unreasonable. Deals poorly with inappropriate entries*.

o Miscellaneous Concerns

(++) Prerequisite concepts and vocabulary are quite reasonable. Operates properly and is free of bugs*.

(+) Program is fairly well structured and documented internally.

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* Good implementation of the feature referred to is considered essential for effective courseware.

Evaluative information provided by Dresden Associates.

STORY TELLING

English: Reading
Grade Levels: 2 - 6

Practice recalling facts about a very short story.

TRS-80
Summary Rating: 6/10

Supplier: Jensen Software, 1589 Blossom Park, Lakewood, OH 44107.
Language: Level II BASIC.

Equipment: 16K TRS-80 Model I.
Packaging/price: On cassette, $9.95.

FUNCTIONAL DESCRIPTION

The program presents a short one-paragraph story, then asks six multiple-choice questions about it. As soon as the student answers a question, a new item is presented. A report of the number correct is given after the questions.

The program contains two different story formats and also can randomly change several adjectives and nouns each time a story is presented. These features make it possible to present multiple exercises which, although similar, involve somewhat different stories.

EVALUATION

COMMENTS

This program has very little to recommend it. It is uninteresting (dialog not personalized, no graphics, no change in responses or pace, humor, etc.), it doesn't provide for individual needs, it does not filter out many irrelevant entries (accidental entry of a number other than one of those referring to the answers is scored as a "wrong"), and there is verly little documentation (one four-line paragraph).

CHARACTERISTICS

o Documentation

(++) Includes goals statement and suggested teaching strategy. Documentation is written clearly*.

(-) Does not include suggested course/-subject and grade levels, stated performance objectives, correlation with standard tests, prerequisites for use of the program, operating instructions*, listing and sample run of program, and suggested follow-up references/activities.

o Instructions Given to User by Program

(-) Instructions regarding the instructional task are poor. Instructions regarding interacting with the program are inadequate*.

o Student-Computer Dialog

(++) Output is paged. User controls continuing to the next page. Appropriate amount of information in each page. Perceptual impact of information presented is suitable. Output spaced and formatted well. Language is well suited to most students' reading abilities. Uses correct grammar, spelling, hyphenation, and punctuation*. Student may respond with common symbols and ways of using them. Accepts abbreviations for common responses. Allows a reasonable number of wrong answers. Good use of devices such as objective formats to minimize bad entries. All required entries are within student capabilities*.

(+) Some use of devices to get and maintain interest. More or less adequate reporting of student performance.

(-) Does not provide for individual needs*. Dialog is not personalized. Makes poor use of graphics. Reinforcing responses are inappropriate. Deals poorly with inappropriate entries*.

o Miscellaneous Concerns

(++) Prerequisite concepts and vocabulary are quite reasonable. Operates properly and is free of bugs.

(-) Program is not well structured and documented internally.

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* Good implementation of the feature referred to is considered essential for effective courseware.

Evaluative information provided by Dresden Associates.

WORD FAMILIES

English: Reading
Grade Levels: 1 - 4

Practice supplying missing letter in word families.

Apple
Summary Rating: 8/10

Supplier: Hartley Courseware, Inc., P.O. Box 431, Dimondale, MI 48821 Tel: 616-942-8987.
Language: Applesoft BASIC.

Equipment: 32K Apple with disk drive.
Packaging/price: On disk, $29.95.

FUNCTIONAL DESCRIPTION

Four programs: practice, student planning, file builder, and file corrector. The practice program covers three types of problems separately: initial consonants, final consonants, and median vowels. It presents a word with an underlined letter and four possible substitutes for the letter, along with a three-dimensional TV set. The student enters all of the substitute letters which he or she believes will make legal words. On a correct choice, the new word is placed on the screen of the TV set. Wrong choices are ignored (but recorded). After all correct choices are entered, hitting any key causes the screen to dissolve, and a new problem is presented. After five problems, the program draws a color graphics face which winks, talks, etc. Pressing the Escape key at any point brings a report of the entire session. The student planning program allows the teacher to review all students' performance. The two file programs enable the teacher to build and correct word files for use by the practice program.

EVALUATION

COMMENTS

This is a good program but needs some variation in presentation to hold student interest. The most attractive features are: nice color graphics, good reinforcing responses, excellent recording and reporting of student performance, and very good user-proofing. Also, the program is structured, and documentation includes some instructions for tailoring.

The following deficiencies should be corrected: (1) documentation should be augmented to include the features listed below under Characteristics; (2) the instructions given by the program are not clear regarding the instructional task; (3) dialog could be made more interesting by using the student's name and by varying the presentation format and responses; (4) the only provision for adapting to individual differences involves having the teacher give the student a different word list to work with; and (5) there are no provisions for giving help to students having difficulty.

CHARACTERISTICS

o Documentation

(++) Includes suggested course/subject and grade levels, goals statement, and operating instructions*. Documentation is written clearly*.

(-) Does not include stated performance objectives, suggested teaching strategies, correlation with standard texts, prerequisites for use of the program, listing and sample run of program, and suggested follow-up references/activities.

o Instructions Given to User by Program

(++) Complete instructions are given regarding interacting with the program*. The user may skip instructions if already known.

(+) Instructions regarding the instructional task are fair.

o Student-Computer Dialog

(++) Output is paged. User controls continuing to the next page. Appropriate amount of information in each page. Perceptual impact of information presented is suitable. Output spaced and formatted well. Language is well suited to most students' reading abilities. Uses correct grammar, spelling, hyphenation, and punctuation*. Student may respond with common symbols and ways of using them. Makes good use of graphics and color. Reinforcing responses are quite appropriate. Allows a reasonable number of wrong answers. Responds appropriately to excessive wrong answers*. Deals quite well with inappropriate entries*. All required entries are within student capabilities*. Good reporting of student performance.

(continued on page 52)

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* Good implementation of the feature referred to is considered essential for effective

WORD FAMILIES

English: Reading
Grade Levels: 1 - 3

Primary students learn to discriminate among phonograms.

Apple
Summary Rating: 9/10

Producer: Hartley Software, 3268 Coach Lane #2A, Kentwood, MI 49508, Tel: 616/-942-8987.
Language: Applesoft BASIC.

Equipment: 48K Apple with disk.
Packaging/price: Package of 3 programs on disk, $29.95.

FUNCTIONAL DESCRIPTION

Word Families has primary students work with phonograms and provides performance information for the teacher. It uses a familiar framework, the TV screen, in which to do so. The program works with beginning and final consonants, and median vowels. Students choose appropriate substitutions in these areas and do so in a fun way. The teacher is involved in menu selection and any desired alterations in the word lists. The program was designed by a second grade teacher who has a masters degree in reading.

EVALUATION

COMMENTS

Features that we like include: (1) letters are just like the ones kids work with all day - large and easy to read; (2) the program is silent - no distracting "Beeps" or songs, etc.; (3) teachers can easily change the word lists to fit individual class and student needs; (4) complete records are kept by the computer and can be obtained in hard copy form; and (5) the computer records incorrect answers. This helps the teacher diagnose problems.

CHARACTERISTICS

o Documentation

(++) Includes description of suggested teaching strategies and student exercises. Includes operating instructions*. Documentation is written clearly*.

(+) Partially fulfills the need for suggested course/subject and grade levels, stated goals, and listing and sample run of programs.

(-) Does not include stated performance objectives, correlation with standard texts, prerequisites for use of the program, or suggested follow-up references/-activities.

o Instructions Given to User by Program

(++) Adequate instructions are given regarding the instructional task. Complete instructions are given regarding interacting with the program*. The user may skip instructions if already known.

o Student-Computer Dialog

(++) Output is paged. User controls continuing to the next page. Appropriate amount of information in each page. Perceptual impact of information presented is suitable. Output spaced and formatted well. Language is well suited to most students' reading abilities. Uses correct grammar, spelling, hyphenation, and punctuation*. Student may respond with common symbols and ways of using them. Makes good use of graphics. Reinforcing responses are quite appropriate. Allows a reasonable number of wrong answers. Responds appropriately to excessive wrong answers*. Good use of devices such as objective formats to minimize bad entries. Deals quite well with inappropriate entries*. All required entries are within student capabilities*. Good reporting of student performance.

(+) Dialog is partially personalized. Some use of devices to get and maintain interest.

o Miscellaneous Concerns

(++) Prerequisite concepts and vocabulary are quite reasonable. Operates properly and is free of bugs*. Program is well structured and documented internally.

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* Good implementation of the feature referred to is considered essential for effective courseware.

Evaluative information provided by Steve Barnard, Principal,
Huntington Woods Elementary School, Wyoming, Michigan.

COMPU-SPELL

English: Spelling
Grade Levels: 4 - 9

Spelling practice with performance monitoring.

Apple
Summary Rating: 8/10

Producer: Edu-Ware Services, 22222 Sherman Way, Canoga Park, CA 91303 Tel: 213/-346-6783.
Language: Applesoft BASIC.

Equipment: 48K Apple with disk.
Packaging/price: Program disk and one word disk $39.95; additional word disks $19.95 each.

FUNCTIONAL DESCRIPTION

Presents words in sentence context; word is blanked, and student types in. Program responds only when student enters correct letters. Program records performance for up to 60 students in individual disk files and produces reports. Upper/lower case letter display. Six word disks containing 800-1200 words each.

EVALUATION

COMMENTS

The manual, although quite good in most respects, is hard to use for a teacher not familiar with computer managed instruction.

CHARACTERISTICS

o Documentation

(++) Includes suggested course/subject and grade levels, goals statement, performance objectives, prerequisites for use, suggested teaching strategies, correlation with standard texts, operating instructions*, and listing and sample runs of program. Documentation is written clearly*.

(+) Partially fulfills the need for student exercises and answers.

(-) Does not include follow-up discussion topics and references/activities.

o Instructions Given to User by Program

(++) Adequate instructions are given regarding the instructional task. Complete instructions are given regarding interacting with the program*.

(-) The user may not skip instructions if already known.

o Student-Computer Dialog

(++) Output is paged. Amount of information in each page is appropriate. Perceptual impact of information presented is suitable. Output spaced and formatted well. Language is well suited to most students reading abilities. Uses correct grammar, spelling, hyphenation, and punctuation*. The coordinate system used is consistent with common conventions. Student may respond with common symbols and ways of using them. Provides well for individual needs*. Dialog is well personalized. Makes good use of devices to get and maintain interest. Makes good use of graphics. Reinforcing responses are quite appropriate. Allows a reasonable number of wrong answers. Responds appropriately to excessive wrong answers*. Includes good provisions for giving help if difficulty is encountered*. Good use of devices such as objective formats to minimize bad entries. Deals quite well with inappropriate entries*. All required entries are within student capabilities*. Good reporting of student performance.

(-) User has limited control over continuing to the next page. Does not accept abbreviations for common responses. Color and sound are not used well.

o Miscellaneous Concerns

(++) Prerequisite concepts and vocabulary are quite reasonable. Operates properly and is free of bugs*. Program is well structured and documented internally.

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* Good implementation of the feature referred to is considered essential for effective courseware.

Evaluative information provided by Jim Bradshaw,
Director, Multi-Media Educational Centers, Chicago, Illinois.

LEARN TO SPELL

English: Spelling
Grade Levels: 1 - 3

Student fills in missing
initial letters of word families.

TRS-80
Summary Rating: 6/10

Supplier: Jensen Software, 1589 Blossom Park, Lakewood, OH 44107.
Language: Level II BASIC.

Equipment: 16K TRS-80 Model I.
Packaging/price: On cassette, $9.95.

FUNCTIONAL DESCRIPTION

The program gives the last two letters of a word family. The student tries to identify all the words stored in the program (six to eight for each family) by entering what he or she believes to be logical first letters. If the student enters a letter not considered correct by the program, it merely reports this to the student and then allows continued entries. The program reports student performance after completion of each family.

EVALUATION

COMMENTS

This program is not very effective. It does not contain instructions, so they must be provided by the teacher on the basis of a six-line description (no other documentation). The program does not provide for individual needs by automatically giving easier or harder words based on student performance, nor does it contain comments to tell the teacher how to change the words contained initially. The program does not provide opportunity for students having trouble to get hints or clarifications. Allowing unlimited wrong answers is bad teaching practice. It is dull and uninteresting - it does not use graphics and contains no devices to get and maintain interest. It does not screen out irrelevant entries.

CHARACTERISTICS

o Documentation

(++) Includes goals statement and suggested teaching strategy. Documentation is written clearly*.

(-) Does not include suggested course/-subject and grade levels, stated performance objectives, correlation with standard texts, prerequisites for use of the program, operating instructions*, listing and sample run of program, and suggested follow-up references/activities.

o Instructions Given to User by Program

(-) The program does not provide instructions.

o Student-Computer Dialog

(++) Output spaced and formatted well. Language is well suited to most students' reading abilities. Uses correct grammar, spelling, hyphenation and punctuation*. Student may respond with common symbols and ways of using them. Reinforcing responses are quite appropriate. All required entries are within student capabilities*. Good reporting of student performance.

(-) Does not provide for individual needs*. Dialog is not personalized. Does not use devices to get and maintain interest. Makes poor use of graphics. Number of wrong answers allowed is unreasonable. Gives no opportunity to get help if difficulty is encountered*. No use of devices to minimize bad entries. Deals poorly with inappropriate entries*.

o Miscellaneous Concerns

(++) Prerequisite concepts and vocabulary are quite reasonable. Operates properly and is free of bugs*.

(-) Program is not well structured and documented internally.

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* Good implementation of the feature referred to is considered essential for effective courseware.

Evaluative information provided by Dresden Associates.

SPELL 'N TIME

Any Department: Spelling
Grade Levels: 1 - 12

Timed spelling drill on teacher-selected words.

Apple/TRS-80/PET
Summary Rating: 8/10

Supplier: Courseware Magazine, 4919 N. Millbrook #222, Fresno, CA 93726.
Language: Applesoft, Level II, or PET BASIC.

Equipment: 16K Apple or TRS-80 Model I, 8K PET.
Packaging/price: On cassette, $12.95.

FUNCTIONAL DESCRIPTION

Program provides drill in spelling words selected by the teacher. Word blinks inside a box, student spells the word by typing it in another box. If missed, the word blinks inside the box by syllables. If student still misspells the word, it remains in the first box and the student types it in the second box.

EVALUATION

COMMENTS

This program is successful with students of varying spelling and typing abilities and would be excellent for learning specific vocabulary in subject areas. The only student complaint is that the words flash on and off the screen too quickly (though the program does adjust presentation time after a series of incorrect responses). The weakest part of the program is the scoring mechanism which is determined by: (1) accuracy of spelling; and (2) speed of response. Nowhere is the significance of the student's score adequately explained. However, over-all, the format and concept are appealing, and the program accomplishes its objectives.

CHARACTERISTICS

o Documentation

(++) Includes suggested course/subject and grade levels, goals statement, performance objectives, description of suggested teaching strategies, and prerequisites for use of the program. Documentation is written clearly*.

(+) Partially fulfills the need for operating instructions*, listing and sample run of program, and possible follow-up references/activities.

o Instructions Given to User by Program

(+) Partial instructions are given regarding interacting with the program*.

(-) Instructions regarding the instructional task are poor.

o Student-Computer Dialog

(++) Output is paged. User controls continuing to the next page. Appropriate amount of information in each page. Perceptual impact of information presented is suitable. Output spaced and formatted well. Language is well suited to most students' reading abilities. Uses correct grammar, spelling, hyphenation, and punctuation*. The coordinate system used is consistent with common conventions. Student may respond with common symbols and ways of using them. Accepts abbreviations for common responses. Provides well for individual needs*. Reinforcing responses are quite appropriate. Allows a reasonable number of wrong answers. Responds appropriately to excessive wrong answers*. Includes good provisions for giving help if difficulty is encountered*. Deals quite well with inappropriate entries*. Good reporting of student performance.

(+) Some use of devices to get and maintain interest. Makes fair use of graphics. Most required entries are within student capabilities*.

(-) Dialog is not personalized.

o Miscellaneous Concerns

(++) Prerequisite concepts and vocabulary are quite reasonable. Operates properly and is free of bugs*. Program is well structured and documented internally.

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* Good implementation of the feature referred to is considered essential for effective courseware.

Evaluative information provided by Gretchen Greiner,
Librarian, Weatherbee School, Hampden, Maine 04444.

VOCAB

English: Vocabulary
Grade Levels: 7 - 11

Study and drill
on synonyms.

PET
Summary Rating: 7/10

Supplier: Tycom Associates, 69 Velma Ave., Pittsfield, MA 01201.
Language: BASIC.

Equipment: 8K PET.
Packaging/price: On cassette, $15.95.

FUNCTIONAL DESCRIPTION

This program is intended to help students learn synonym pairs. It is available in easier and harder versions, each of which contains 570 synonym pairs. Both versions operate as follows: There are two operating modes, study and quiz. In study mode, word pairs are presented, a page at a time, for perusal by the student. In quiz mode, the program asks a question in the form, "I am thinking of a 5-letter word meaning severe; what is the word?" The student gets two chances to guess the word. On an exactly correct answer, the program reports it such and goes on to the next word. On an error, it checks for a close spelling and reports it if present; if not, the program may give a clue about the length of the word or its first two letters. Student performance is reported at the end of a quiz session.

EVALUATION

COMMENTS

This is a more or less adequate program. Its best features are: (1) giving useful hints to help a student find the right word; and (2) checking student entries for possible right word but wrong spelling.

However, there are several shortcomings which should be corrected. Insufficient documentation is included - it should include information on how to change word pairs, and the entire list, if so desired. Also, the instructions given by the program are poorly formatted and hard to read. Furthermore, the program does not vary difficulty level to meet individual needs. It does not include measures to get and maintain interest, such as variation of format and response, change of pace, etc. And finally, the program does not screen out non-letter entries.

CHARACTERISTICS

o Documentation

(++) Includes goals statement and operating instructions*. Documentation is written clearly*.

(-) Does not include stated performance objectives, suggested teaching strategies, correlation with standard texts, prerequisites for use of the program, listing and sample run of program, and suggested follow-up references/activities.

o Instructions Given to User by Program

(++) Adequate instructions are given regarding interacting with the program*, and regarding the instructional task.

(-) The user may not skip instructions if already known.

o Student-Computer Dialog

(++) Output is paged. User controls continuing to the next page. Perceptual impact of information presented is suitable. Appropriate amount of information in each page. Language is well suited to most students' reading abilities. Uses correct grammar, spelling, hyphenation, and punctuation*. Student may respond with common symbols and ways of using them. Reinforcing responses are quite appropriate. Allows a reasonable number of wrong answers. Responds appropriately to excessive wrong answers*. Includes good provision for giving help if difficulty is encountered*. Needed entries within student abilities*.

(+) Fairly appropriate spacing and formatting of output. More or less adequate reporting of student performance.

(-) Does not provide for individual needs*. Does not use devices to get and maintain interest. Makes poor use of graphics. Deals poorly with inappropriate entries*.

o Miscellaneous Concerns

(++) Prerequisite concepts and vocabulary are quite reasonable. Operates properly and is free of bugs*.

(-) Program is not well structured and documented internally.

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* Good implementation of the feature referred to is considered essential for effective courseware.

Evaluative information provided by Dresden Associates.

ELECTRONICS

Science: General Science,
Physics
Industrial Arts: Electronics
Grade Levels: 9 - 12

Practice working Ohm's
Law problems.

TRS-80
Summary Rating: 6/10

Supplier: Westinghouse Learning Corp.,
5005 West 110th St., Oak Lawn, IL 60453.
Language: Level II BASIC.

Equipment: TRS-80 Model I.
Packaging/price: One of 4 programs in Science Package I, $24.95.

FUNCTIONAL DESCRIPTION

Electronics tests a student's knowledge of Ohm's Law in calculating I and R.

EVALUATION

COMMENTS

The program assumes that the student knows Ohm's Law thoroughly. No instruction on it is given. It is very impersonal but clear in what is desired. Immediate reinforcement is given.

CHARACTERISTICS

o Documentation

No supporting documentation is provided*.

o Instructions Given to User by Program

(++) Adequate instructions are given regarding the instructional task. Complete instructions are given regarding interacting with the program.

(-) The user may not skip instructions if already known.

o Student-Computer Dialog

(++) Output is paged. User controls continuing to the next page. Appropriate amount of information in each page. Output spaced and formatted well. Language is well suited to most students' reading abilities. Uses correct grammar, spelling, hyphenation, and punctuation*. The coordinate system used is consistent with common conventions. Student may respond with common symbols and ways of using them. Makes good use of graphics. Reinforcing responses are quite appropriate. Allows a reasonable number of wrong answers. Responds appropriately to excessive wrong answers*. All required entries are within student capabilities*. Good reporting of student performance.

(+) Includes some provisions for individual needs*. Deals fairly well with inappropriate entries*.

(-) Dialog is not personalized. Does not use devices to get and maintain interest. Sound is not used well. Gives no opportunity to get help if difficulty is encountered*. No use of devices to minimize bad entries.

o Miscellaneous Concerns

(++) Prerequisite concepts and vocabulary are quite reasonable. Operates properly and is free of bugs*. Program is well structured and documented internally.

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* Good implementation of the feature referred to is considered essential for effective courseware.

Evaluative information provided by Mary E. Harris,
Marine City High School, Marine City, Michigan.

. . . .

WORKING WITH BASIC MULTIPLICATION FACTS (continued from page 36)

most students' reading abilities. Dialog is not personalized. Number of wrong answers allowed is unreasonable. Responds inappropriately to excessive wrong answers*.

o Miscellaneous Concerns

(+) Prerequisite concepts and vocabulary are fairly reasonable. Operates fairly well*. Program is more or less suitably structured and documented internally.

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* Good implementation of the feature referred to is considered essential for effective courseware.

Evaluative information provided by Peter Joyce,
Consultant, East York Board of Education, Toronto, Ontario Canada.

ADD

Mathematics: Algebra
Grade Levels: 8 - 10

Practice adding and subtracting algebraic binomials.

PET
Summary Rating: 6/10

Supplier: Tycom Associates, 69 Velma Ave., Pittsfield, MA 01201.
Language: BASIC.

Equipment: 8K PET.
Packaging/price: In Algebra cassette package; seven programs, $19.95.

FUNCTIONAL DESCRIPTION

This program presents an unlimited number of problems involving adding and subtracting binomials in horizontal format, e.g., (3x-9) - (6x+4). The student enters his or her final answer. If this is correct, the program so states and goes on to the next problem. If the first answer is incorrect, it gives the correct answer and proceeds to the next problem.

EVALUATION

COMMENTS

This is not a very effective program. Its only advantage over paper and pencil exercises is immediate feedback, and even that is not done very well.

The most damaging shortcomings are: (1) insufficient documentation (although good operating instructions); (2) unvarying format and responses, making the dialog dull; (3) no change in problem difficulty to meet individual needs; (4) only one trial allowed; (5) no hints or clarifications; (6) no checking for obvious typographical errors; and (7) no performance reporting. The program could be improved greatly by allowing the student to work out problems on-line and giving immediate feedback for each step rather than only handling final answers.

CHARACTERISTICS

o Documentation

(++) Includes goals statement and operating instructions*. Documentation is written clearly*.

(-) Does not include suggested course/-subject and grade levels, stated performance objectives, suggested teaching strategies, correlation with standard texts, prerequisites for use of the program, listing and sample run of program, and suggested follow-up references/activities.

o Instructions Given to User by Program

(++) Adequate instructions are given regarding the instructional task. Complete instructions are given regarding interacting with the program*.

(-) The user may not skip instructions if already known.

o Student-Computer Dialog

(++) Output is paged. User controls continuing to the next page. Appropriate amount of information in each page. Perceptual impact of information presented is suitable. Output spaced and formatted well. Language is well suited to most students' reading abilities. Uses correct grammar, spelling, hyphenation, and punctuation*. Student may respond with common symbols and ways of using them. Reinforcing responses are quite appropriate. Responds appropriately to excessive wrong answers*. All required entries are within student capabilities*. Good reporting of student performance.

(-) Does not provide for individual needs*. Dialog is not personalized. Does not use devices to get and maintain interest. Makes poor use of graphics. Number of wrong answers allowed is unreasonable. Gives no opportunity to get help if difficulty is encountered*. No use of devices to minimize bad entries. Deals poorly with inappropriate entries*.

o Miscellaneous Concerns

(++) Prerequisite concepts and vocabulary are quite reasonable. Operates properly and is free of bugs*.

(-) Program is not well structured and documented internally.

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* Good implementation of the feature referred to is considered essential for effective courseware.

Evaluative information provided by Dresden Associates.

Mathematics: Algebra
Grade Levels: 7 - 9

ALGEBRA BILLIARDS

Practice on algebra
substitution in fun format.

TRS-80
Summary Rating: 8/10

Supplier: Curriculum Applications, P.O. Box 264, Arlington, MA 02174.
Language: Level II BASIC.

Equipment: 16K TRS-80 Model I.
Packaging/price: One program on cassette, $16.95.

FUNCTIONAL DESCRIPTION

The program gives practice in working algebra substitution problems at the same time a game of billiards is going on. First, the program "racks up" the characters to be used in the upcoming problem, and the student "breaks" by pressing the "C" key (cue ball). The characters bounce around and settle into the expression to be evaluated (3 variables, first degree). The values of two variables are given. The student is asked first to identify the unknown variable and then to direct a series of steps to solve the problem, using the known values. He or she starts with 15 points and loses some at each incorrect response. If the student gives two incorrect responses in a row, the program gives help by partially solving the problem. Graphics and sound are used extensively throughout a session.

EVALUATION

COMMENTS

I'm not a math oriented person, but I found this to be a good program in most respects. It does contain one deficiency which causes a kind of dilemma: The problems may not be broken down into small enough steps for those students who need tutoring, but the pace may be too slow for those who don't need help. (easy to fix, I expect.)

I especially like the following things: (1) the billiard-game format adds interest; (2) the sound effects and commentary add a nice dash of humor; (3) the student can work at his own pace; and (4) inappropriate keys (Break, letters where numbers are called for, etc.) are disabled.

The program itself does not contain provisions for changing difficulty levels to meet individual needs. However, the accompanying documentation gives instructions for easy program modifications which the teacher can make to provide easier or harder problems.

CHARACTERISTICS

o Documentation

(++) Includes performance objectives, operating instructions*, and listing and sample runs of program. Documentation is written clearly*.

(+) Partially fulfills the need for course/subject guidelines and stated goals.

(-) Does not include suggested teaching strategies, correlation with standard texts, prerequisites for use of the program, student exercises, suggested follow-up discussion topics, and suggested follow-up references/activities.

o Instructions Given to User by Program

(++) Adequate instructions are given regarding the instructional task. Complete instructions are given regarding interacting with the program*.

(-) The user may not skip instructions if already known.

o Student-Computer Dialog

(++) Output is paged. User controls continuing to the next page. Appropriate amount of information in each page. Perceptual impact of information presented is suitable. Output spaced and formatted well. Language is well suited to most students' reading abilities. Uses correct grammar, spelling, hyphenation, and punctuation*. Student may respond with common symbols and ways of using them. Accepts abbreviations for common responses. Dialog is well personalized. Makes good use of devices to get and maintain interest. Makes good use of sound and graphics. Reinforcing responses are quite appropriate. Allows a reasonable number of wrong

(continued on page 52)

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* Good implementation of the feature referred to is considered essential for effective courseware.

TIC TAC PET

Mathematics: Algebra
Grade Levels: 8 - 10

Practice in solving linear equations, game format.

PET
Summary Rating: 7/10

Supplier: National Coordinating Center for Curriculum Development, SUNY, Stony Brook, NY 11794 Tel: 516/246-8418.
Language: BASIC.

Equipment: 8K PET.
Packaging/price: Individually on cassette, $5; in package of 15 programs, $50. Also available on disk.

FUNCTIONAL DESCRIPTION

The program presents a Tic Tac Toe board with a linear equation in each cell. Two players take turns selecting and trying to solve three equations in a row. If an equation is solved correctly, the marker of the player who solved it is placed in the cell. If the player selecting an equation gets it wrong (one try), the other player gets a chance. If both players are wrong, problem selection passes to the other player. At the beginning of the game, players may select one of 9 difficulty levels.

EVALUATION

COMMENTS

This program provides an effective way to practice solving linear equations. The game format is enjoyable, the nine difficulty levels provide for individual needs (assuming that students with similar needs are playing together), and graphics are used effectively. Also, students playing the game together should learn from each other as one student solves an equation which another could not handle.

The program would have been rated an 8 if it weren't for one serious defect. The handling of inappropriate entries is very poor; accidental pressing of the Return Key without a preceding value and entry of non-numeric data both can completely destroy the playing board, and there is no recovery. Also the dialog is not personalized, and the program does not report students' performance at the end of a game. And finally, the accompanying documentation (eight lines) is not sufficient.

CHARACTERISTICS

o Documentation

(++) Includes suggested course/subject and grade levels and goals statement. Documentation is written clearly*.

(-) Does not include performance objectives, suggested teaching strategies, correlation with standard texts, prerequisites for use, operating instructions*, listing and sample run of program, and suggested follow-up references/activities.

o Instructions Given to User by Program

(++) Adequate instructions are given regarding interacting with the program* and regarding the instructional task. The user may skip instructions.

o Student-Computer Dialog

(++) Output is paged. User controls continuing to the next page. Appropriate amount of information in each page. Perceptual impact of information presented is suitable. Language is well suited to most students' reading abilities. Uses correct grammar, spelling, hyphenation, and punctuation*. Student may respond with common symbols. Provides well for individual needs*. Makes good use of devices to maintain interest. Makes good use of graphics. Reinforcing responses are appropriate. Allows a reasonable number of errors*. All required entries are within student capabilities*.

(+) Output is formatted fairly well.

(-) Dialog is not personalized. No use of devices to minimize bad entries. Deals poorly with inappropriate entries. Poor reporting of student performance.

o Miscellaneous Concerns

(++) Prerequisite concepts and vocabulary are quite reasonable. Operates properly*.

(-) Program is not well structured and documented internally.

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* Good implementation of the feature referred to is considered essential for effective courseware.

Evaluative information provided by Dresden Associates.

COMPU-MATH ARITHMETIC SKILLS

Mathematics: Arithmetic
Grade Levels: 1 - 4

Tutorial on four basic operations.

Apple
Summary Rating: 9/10

Supplier: Edu-Ware Services, 22222 Sherman Way, Canoga Park, CA 91303 Tel: 213/-346-6783.
Language: Applesoft BASIC.

Equipment: 48K Apple with disk.
Packaging/price: Disk package, $49.95.

FUNCTIONAL DESCRIPTION

Teaches the student, in a step-by-step fashion, how to add, subtract, multiply, and divide. Records and monitors the progress of each student and moves students on to the next level based on performance. Includes provisions for individually prescribing instruction.

EVALUATION

CHARACTERISTICS

o Documentation

(++) Includes suggested course/subject and grade levels, goals statement, performance objectives, prerequisites for use, suggested teaching strategies, correlation with standard texts, operating instructions*, and listing and sample runs of program. Documentation is written clearly*.

(+) Partially fulfills the need for student exercises and suggested follow-up discussion topics.

(-) Does not include suggested follow-up references/activities.

o Instructions Given to User by Program

(++) Adequate instructions are given regarding the instructional task. Complete instructions are given regarding interacting with the program*.

(+) The user may skip some instructions if already known.

o Student-Computer Dialog

(++) Output is paged. Amount of information in each page is appropriate. Perceptual impact of information presented is suitable. Output spaced and formatted well. Language is well suited to most students' reading abilities. Uses correct grammar, spelling, hyphenation, and punctuation. Student may respond with common symbols and ways of using them. Provides well for individual needs*. Dialog is well personalized. Makes good use of graphics. Reinforcing responses are quite appropriate. Allows a reasonable number of wrong answers. Responds appropriately to excessive wrong answers*. Includes good provisions for giving help if difficulty is encountered*. Deals quite well with inappropriate entries*. All required entries are within student capabilities*. Good reporting of student performance.

(+) Some use of devices to get and maintain interest and to minimize bad entries. Color is used fairly well.

(-) User has limited control over continuing to the next page. Does not accept abbreviations for common responses. Sound is not used well.

o Miscellaneous Concerns

(++) Prerequisite concepts and vocabulary are reasonable. Operates properly and is free of bugs*. Program is well structured and documented internally.

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* Good implementation of the feature referred to is considered essential for effective courseware.

Evaluative information provided by Jim Bradshaw,
Director, Multi-Media Educational Centers, Chicago, Illinois.

INTRODUCTION TO MATHEMATICS ON THE COMPUTER

Mathematics: Arithmetic
Grade Levels: 1 - 4

Practice with four arithmetic operations on whole numbers.

TRS-80
Summary Rating: 7/10

Supplier: Educational Activities, P.O. Box 392, Freeport, NY 11520 Tel: 516/-223-4666.
Language: Level II BASIC.

Equipment: 16K TRS-80 Model I.
Packaging/price: On cassette, $29.95.

FUNCTIONAL DESCRIPTION

The procedures for all four operations are similar: First, the student chooses which of the four operations he or she will practice and then one of the 6 difficulty levels. The program presents a set of 20 problems, one at a time. First, a problem is given in pure numeric form, along with four answer choices, and the student types in an answer. If the answer is incorrect, he or whe gets another chance. On the secind error, the problem is presented in word form, e.g., "If you had 6 dollars in your pocket and I gave you 3 more, how many dollars would you have?" If the answer is wrong this time, the program switches back to all-numeric mode and continues alternating, giving six tries in all. If still wrong on the sixth try, the program gives the correct answer and goes on to a new problem. If the student answers correctly on any trial, the program displays the problem and answer again before going on to a new problem. If he or she scores better than 85% on a problem set, the program automatically promotes to the next operation, or if complete, to the next higher level. In multiplication and division, the program does not give problems in word format and allows only four tries.

EVALUATION

COMMENTS

This program is more or less adequate. Its most attractive features are multiple difficulty levels and automatic adaptation of difficulty based on performance. Also, the program varies reinforcing responses, uses the student's namo, uses the word problem format to give a different perspective on problems, and offers multiple-choice responses.

The most serious deficiencies are: (1) six trials is excessive, especially in the case of a multiple-choice format; (2) the results of columnar addition and subtraction must be entered left to right rather than in the customary manner; and (3) the program does a poor job of screening out irrelevant entries such as letters, numbers other than the choices shown, and the Enter key. Also, the initial dialog, which cannot be skipped, tries to be a little too "cute", and could be very offensive after a while. The student has no control over proceeding to the next page. Timeouts are used instead, which makes the pace very slow, especially for a student who is doing well. Furthermore, the program does not use graphics and devices to maintain interest other than varied responses - it would tend to get monotonous. And, the program offers no periodic reports as feedback. And finally, we don't like programs to personalize the computer/program; this one does - it calls itself "Frank".

CHARACTERISTICS

o Documentation

(++) Includes goals statement, prerequisites for use, and operating instructions*. Documentation is written clearly*.

(+) Partially fulfills the need for suggested course/subject/grade levels and performance objectives.

(-) Does not include suggested teaching strategies, correlation with standard texts, listing and sample run of program, and suggested follow-up references/activities.

o Instructions Given to User by Program

(++) Adequate instructions are given regarding the instructional task.

(-) Instructions regarding interacting with the program are inadequate*. The user may not skip instructions.

o Student-Computer Dialog

(++) Output is paged. Appropriate amount of information in each page. Perceptual impact of information presented is suitable. Output spaced and formatted well.

(continued on page 53)

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* Good implementation of the feature referred to is considered essential for effective courseware.

LEGACY

Mathematics: Arithmetic
Grade Levels: 1 - 3

Practice on multiplication facts in game format.

Apple
Summary Rating: 7/10

Supplier: Cook's Computer Co., 1905 Bailey Drive, Marshalltown, IA 50158.
Language: Applesoft BASIC.

Equipment: 32K Apple with disk drive.
Packaging/price: In 14-program disk package, $19.95.

FUNCTIONAL DESCRIPTION

The player tries to guess the number hidden in a marked box located in a randomly located cell of a 1 X 9 grid before the computer locates the box. After the program presents the grid and marked box, it positions its own marker in the lower left corner of the grid and begins to search for the marked box, moving box-by-box, row-by-row, up the grid. Meanwhile, the player tries to guess the number in the box (which is the product of the column and row numerical designators) and type it in. If the player types the correct number before the computer finds the box, the number is added to the player's score; otherwise, the computer adds it to its own score.

EVALUATION

COMMENTS

This is an enjoyable and potentially exciting drill, but it needs work. Among the most attractive features is the concept of the game itself - it's quite creative. Also, the user-proofing (disabling of irrelevant keys) is fairly good. It uses sound nicely. Finally the program is well documented and structured to facilitate modification.

The following matters need attention. Adequate documentation should be provided. The instructions given by the program should be broken up among several pages; currently too much is presented all at once. Also, provision should be made for skipping instructions if they are known already.

Because the computer always starts at the bottom of the grid, it's too easy for the student to get high scores. This could be improved by making the computer's search speed proportional to the size of the multiplication result.

The program gives no hints to the player who is having trouble determining the general procedure to follow. The instructions don't tell the student how to identify the number in the box, so a player could get completely frustrated if he or she didn't discover the general idea within the first few tries.

Also, there are no allowances for individual differences. It should be fairly easy to modify the program to work only with operands in a specified range. And finally, the program makes only minimal use of the Apple's graphics capability and no use of color. It could be much more effective if these facilities were put to use.

CHARACTERISTICS

o Documentation

(++) Includes goals statement. Documentation is written clearly*.

(+) Partially fulfills the need for suggested course/subject/grade levels and operating instructions*.

(-) Does not include stated performance objectives, suggested teaching strategies, correlation with standard texts, prerequisites for use of the program, listing and sample run of program, and suggested follow-up references/activities.

o Instructions Given to User by Program

(++) Complete instructions are given regarding interacting with the program*.

(+) Instructions regarding the instructional task are fair.

(-) The user may not skip instructions if already known.

o Student-Computer Dialog

(++) Output is paged. User controls continuing to the next page. Perceptual impact of information presented is suitable. Output is spaced and formatted well. Language is well suited to most students' reading abilities. Uses correct grammar,

(continued on page 53)

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* Good implementation of the feature referred to is considered essential for effective courseware.

MATH PAK!

Mathematics: Arithmetic
Grade Levels: 1 - 5

Practice with four basic arithmetic operations on whole numbers.

TRS-80
Summary Rating: 7/10

Supplier: Edu-Ware, P.O. Box 336, Maynard, MA 01754.
Language: Level II BASIC.

Equipment: 16K TRS-80 Model I.
Packaging/price: On tape, $14.95.

FUNCTIONAL DESCRIPTION

The package contains one program for each operation. All operate more or less like addition which is as follows. First, questions to specify problem difficulty are answered. Then, 10 problems are displayed. The program accepts a result, digit by digit, at the bottom of the screen. If a digit is correct, it is filled in under the problem. If a digit is incorrect, the program so states and gives another chance - up to five trials per digit. On the sixth error, the digit is given, and work proceeds with the next one. Two points are deducted for each digit not entered correctly (out of 10 per problem). After all digits are completed, the program goes on to the next problem. A performance report is given after the last one. If the student's score is 90 or better, he or she is rewarded with a game of "Bomber".

EVALUATION

COMMENTS

This is a fairly effective program. It provides for individual needs - the teacher may specify problem characteristics in moderate detail. (However, there is no automatic adjustment of difficulty level.) Availability of the "Bomber" game is a good incentive to try for high scores. Use of large numberals ensures good readability.

Unfortunately, the program falls down in several areas. The documentation is inadequate. Instructions given by the program can't be bypassed. In the Addition program, problem specialization should be simplified so that the teacher need only type in a simple code to get the desired problem forms (or instruct the student to do so). This would shorten set-up time where several student stations are involved. Allowing five wrong answers per digit is poor teaching practice - two would be more reasonable. There are no provisions for getting help or clarification. There is no screening out the Break key, letters where numbers are wanted, etc. There is no periodic performance report. Graphics are not used well except in the game.

CHARACTERISTICS

o Documentation

(++) Includes goals statement and operating instructions*. Documentation is written clearly*.

(-) Does not include suggested course/subject and grade levels, performance objectives, suggested teaching strategies, correlation with standard texts, prerequisites for use, listing and sample run of program, and suggested follow-up references/activities.

o Instructions Given to User by Program

(++) Complete instructions are given regarding interacting with the program*.

(+) Instructions regarding the instructional task are fair.

(-) The user may not skip instructions.

o Student-Computer Dialog

(++) Output is paged. Appropriate amount of information in each page. Perceptual impact of information presented is suitable. Output spaced and formatted well. Language is well suited to most students' reading abilities. Uses correct grammar, spelling, hyphenation, and punctuation*. Student may respond with common symbols. Provides well for individual needs*. Dialog is personalized. Reinforcing responses are appropriate. Responds appropriately to excessive errors*. All required entries are within student capabilities*.

(+) Some use of devices to maintain interest. Makes moderate use of graphics.

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* Good implementation of the feature referred to is considered essential for effective courseware.

Mathematics: Arithmetic
Grade Levels: 1 - 4

MULTIPLICATION

Practice on whole-number multiplication.

TRS-80
Summary Rating: 7/10

Supplier: Basics and Beyond, P.O. Box 10, Amawalk, NY 10501, Tel: 914/962-2355.
Language: Level II BASIC.

Equipment: 16K TRS-80 Model I or III.
Packaging/price: One of 20 programs in cassette package Microcosm III, $24.95.

FUNCTIONAL DESCRIPTION

Gives on-screen practice in multiplying whole numbers in the same manner as one would do it on paper. The user may choose problems using oversized numerals at any of five difficulty levels. As a problem is being worked, a blinking cursor indicates the position of the digit to be entered. The student may either enter a digit or ask for help in finishing the problem. An end-of-session report gives the number of problems worked correctly with and without help.

EVALUATION

COMMENTS

I am not impressed with this program. A student might just as well use a mimeographed sheet of problems. He or she has no control over continuing to a new problem; the time allowed may not be long enough to allow him or her to digest the results of the current item.

The student is allowed to enter digits in a right-to-left fashion. This is fine for most situations, but may be frustrating with simple problems like 8 X 3 where the natural inclination is to write the result left to right.

Reinforcing responses are more or less appropriate, but the student is penalized (by score) for making an error before the problem has been answered completely and has checked his or her work. The program provides the opportunity to get help in the form of displaying the next digit to be entered. However, this may not be enough. For instance, in the problem 29 X 4, the hint for 4 X 9 would be 6, not 36 - this is not helpful enough. In another area, the "beeps" and flashing lights are distracting.

CHARACTERISTICS

o Documentation

(++) Includes goals statement and operating instructions*.

(+) Partially fulfills the need for suggested course/subject and grade levels and stated performance objectives. Documentation is fairly clear*.

(-) Does not include suggested teaching strategies, correlation with standard texts, prerequisites for use of the program, and listing and sample run of the program.

o Instructions Given to User by Program

(++) Adequate instructions are given regarding the instructional task. The user may skip instructions if already known.

(+) More or less adequate instructions are given regarding interacting with the program*.

o Student-Computer Dialog

(++) Output is paged. Appropriate amount of information in each page. Perceptual impact of information presented is suitable. Output spaced and formatted well. Language is well suited to most students' reading abilities. Uses correct grammar, spelling, hyphenation, and punctuation*. Provides well for individual needs*. Dialog is well personalized. Allows a reasonable number of wrong answers. Responds appropriately to excessive wrong answers*. Deals quite well with inappropriate entries*. All required entries are within student capabilities*.

(+) User has partial control over continuing to the next page. Student may respond usually with common symbols and ways of using them. Some use of devices to get and maintain interest. Fair use of graphics and sound. Reinforcing responses are more or less adequate. Includes moderate provisions for giving help if difficulty is encountered*. Fair reporting of student performance.

Miscellaneous Concerns

(++) Prerequisite concepts and vocabulary are quite reasonable. Operates properly and is free of bugs*.

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* Good implementation of the feature referred to is considered essential for effective courseware.

Evaluative information provided by
Evelyn Anderson, (former teacher), Portland, Maine.

STORY PROBLEMS IN ADDITION & SUBTRACTION

Mathematics: Arithmetic PET
Grade Levels: 3 - 6 Simple word problems involving whole number addition & subtraction. **Summary Rating: 6/10**

Supplier: Micro-Ed, P.O. Box 24156, Minneapolis, MN 55424 Tel: 612/926-2292.
Language: BASIC.
Equipment: 8K PET.
Packaging/price: On cassette, $7.95.

FUNCTIONAL DESCRIPTION

The program presents about 14 story problems requiring addition and subtraction of whole numbers. The problems involve three or four situations. Each problem is different, both as to the question asked and the values included. The student may answer or ask for the right answer. If he or she answers correctly, the program shows a happy face; if not, a monster is displayed. A performance report, inluding elapsed time, is given at session end.

EVALUATION

COMMENTS

This is a moderately effective program. Its best features are the problems themselves - they're interesting - and the variation in problem format.

The following matters need attention. Documentation is inadequate. The program should provide for easier and harder problems to meet the needs of individual students. More than one try at an answer should be allowed, giving the correct answer only after the second error. Irrelevant typing entries should be filtered out. And, the program should report cumulative performance after every four or five problems.

One of the most unfortunate things about the program is the reward for wrong answers, i.e., the monster face, which is probably more attractive to most youngsters than is the positive response used. Also, some variation in reinforcing responses would help.

CHARACTERISTICS

o Documentation

(++) Includes goals statement. Documentation is written clearly*.

(-) Does not include suggested course/-subject and grade levels, stated performance objectives, suggested teaching strategies, correlation with standard texts, prerequisites for use of the program, operating instructions*, listing and sample run of program, and suggested follow-up references/activities.

o Instructions Given to User by Program

(-) Instructions regarding interacting with the program are inadequate*.

o Student-Computer Dialog

(++) Output is paged. User controls continuing to the next page. Appropriate amount of information in each page. Perceptual impact of information presented is suitable. Output spaced and formatted well. Language is well suited to most students' reading abilities. Uses correct grammar, spelling, hyphenation, and punctuation*. Good use of devices to maintain interest. Student may respond with common symbols and ways of using them. All required entries are within student capabilities*.

(+) Includes moderate provisions for giving help if difficulty is encountered*. Fair reporting of student performance. Some use of graphics. More or less adequate reinforcing responses.

(-) Does not provide for individual needs*. Dialog is not personalized. Number of wrong answers allowed is unreasonable. No use of devices to minimize bad entries. Deals poorly with inappropriate entries*.

o Miscellaneous Concerns

(++) Prerequisite concepts and vocabulary are quite reasonable. Operates properly and is free of bugs*.

(-) Program is not well structured and documented internally.

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* Good implementation of the feature referred to is considered essential for effective courseware.

Evaluative information provided by Dresden Associates.

TAKE IT

Mathematics: Arithmetic
Grade Levels: 3 - 7

Drill on signed number
arithmetic in game format.

Apple
Summary Rating: 7/10

Supplier: Cook's Computer Co., 1905 Bailey Drive, Marshalltown, IA 50158.
Language: Applesoft BASIC.

Equipment: 32K Apple with disk drive.
Packaging/price: In 14-program disk package, $19.95.

FUNCTIONAL DESCRIPTION

Timed practice in the four basic arithmetic operations, using signed whole numbers. The player has a choice of one operation or a mixture of all four. The computer and player both start out with equal scores. The computer presents a problem, such as 3 - (-)6. The player computes the answer and then may take it or leave it for the computer, but must do so before his or her time is up. If the student is too late, the program makes the take-it or leave-it decision, always to the detriment of the player. Whichever side gets the result has it added to his or her (or its) score. The over-all score is reported after each problem. Problem difficulty is adjusted based on student performance.

EVALUATION

COMMENTS

In general, this program provides interesting and enjoyable practice with signed whole-number arithmetic, but it has some drawbacks which need attention. The most positive features are the game concept itself, automatic adjustment of problem difficulty, and adequate user proofing (disabling of irrelevant keys). Also, the program is adequately structured and documented to allow modification.

Attention should be given to the following concerns. Adequate documentation should be provided. The instructions given by the program should be broken up among several pages; too much is presented on one page. Provision should be made to allow knowledgeable students to skip the instructions.

The program really needs something to maintain student interest. The author could introduce at least some variation in the computer responses. This would even be better if he took advantage of the Apple's graphics, color, and sound facilities, which are ignored.

And finally, the performance report should be augmented to give an analysis of performance by skill.

CHARACTERISTICS

o Documentation

(++) Includes goals statement. Documentation is written clearly*.

(+) Partially fulfills the need for suggested course/subject/grade levels and operating instructions*.

(-) Does not include stated performance objectives, suggested teaching strategies, correlation with standard texts, prerequisites for use of the program, listing and sample run of program, and follow-up references/activities.

o Instructions Given to User by Program

(++) Adequate instructions are given regarding the instructional task and interacting with the program*.

(-) The user may not skip instructions if already known.

o Student-Computer Dialog

(++) Output is paged. User controls continuing to the next page. Perceptual impact of information presented is suitable. Output spaced and formatted well. Language is well suited to most students' reading abilities. Uses correct grammar, spelling, hyphenation, and punctuation*. Student may respond with common symbols and ways of using them. Provides well for individual needs*. Reinforcing responses are quite appropriate. Allows a reasonable number of wrong answers. Responds appropriately to excessive wrong answers*. Deals quite well with inappropriate entries*. All required entries are within student capabilities*.

(continued on page 3)

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* Good implementation of the feature referred to is considered essential for effective courseware.

TIMES

Mathematics: Arithmetic
Grade Levels: 1 - 3

Timed practice on
multiplication facts through 9.

PET
Summary Rating: 6/10

Supplier: Teacher's PET (Glenn Fisher),
1517 Holly St., Berkeley, CA 94703.
Language: BASIC.

Equipment: 8K PET.
Packaging/price: On cassette, $7.95.

FUNCTIONAL DESCRIPTION

The program presents random multiplication facts up through nines. If the student's answer is correct, the program reinforces this. If he or she gives one wrong answer, the program gives another chance. On a second wrong answer, it gives the correct one and asks the student to type it in (last try). After each problem, the program reports the number of problems answered correctly and the elapsed time for the most recent problem.

EVALUATION

COMMENTS

This role drill is barely adequate. The following deficiencies should be corrected: (1) Documentation is limited to one short paragraph; (2) instructions given by the program are poorly spaced, and include incorrect punctuation and language which may be beyond some students' reading ability; (3) problems are repeated randomly without regard to whether the student has mastered them; (4) there are no provisions to drill on specified numbers or otherwise tailor the problems; (5) the Stop key is not disabled and obvious typographical errors are accepted as legitimate entries; (6) graphics are not used; and (7) the program does not use surprise, variation of response, change of pace, or even personalization to help maintain interest.

CHARACTERISTICS

o Documentation

(++) Includes goals statement. Documentation is written clearly*.

(-) Does not include suggested course/-subject and grade levels, stated performance objectives, suggested teaching strategies, correlation with standard texts, prerequisites for use of the program, operating instructions*, listing and sample run of program, and suggested follow-up references/activities.

o Instructions Given to User by Program

(++) Adequate instructions are given regarding interacting with the program* and regarding the instructional task.

(-) The user may not skip instructions if already known.

o Student-Computer Dialog

(++) Output is paged. User controls continuing to the next page. Perceptual impact of information presented is suitable. Uses correct grammar, spelling, hyphenation, and punctuation*. Student may respond with common symbols and ways of using them. Dialog is well personalized. Reinforcing responses are quite appropriate. Allows a reasonable number of wrong answers. Responds appropriately to excessive wrong answers*. All required entries are within student capabilities*. Good reporting of student performance.

(+) Amount of information in each page is fairly appropriate. Language is more or less suited to most students' reading abilities. Includes some provisions to deal with inappropriate entries.

(-) Output spaced and formatted poorly. Does not provide for individual needs*. Does not use devices to get and maintain interest. Makes poor use of graphics.

o Miscellaneous Concerns

(++) Prerequisite concepts and vocabulary are quite reasonable. Operates properly and is free of bugs*.

(+) Program is fairly well structured and documented internally.

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* Good implementation of the feature referred to is considered essential for effective courseware.

Evaluative information provided by Dresden Associates.

WHOLE NUMBER ARITHMETIC SERIES

Mathematics: Arithmetic
Grade Levels: 2 - 6

Practice on whole number arithmentic.

TRS-80
Summary Rating: 8/10

Supplier: Educational Micro Systems, Inc., P.O. Box 471, Chester, NJ 07930.
Language: Level II BASIC.

Equipment: 16K TRS-80.
Packaging/price: On cassette; $24.95 each operation, $99.95 all four with notebook.

FUNCTIONAL DESCRIPTION

Contains four programs, each of which gives practice with one of the four basic operations. Each program allows the teacher to precisely tailor a session to individual student needs. Options allow control of problem format and difficulty, time allowed, assistance to student, and reinforcing responses. To control problem format and difficulty, the teacher sets variables such as number of digits in operands, placement of zeroes, whether numbers are to be multiples of powers of 10, borrowing (subtraction), whether there are to be remainders (division), etc. The teacher may allow unlimited time to work problems or specify the maximum time allowed. Three student assistance modes are available: none; digit by digit (each digit entered is automatically evaluated and help is supplied if in error); and retry (after two incorrect tries, student solution and correct solution are both displayed and errors are indicated). The only change in reinforcement concerns whether or not, during problem solution, a moving rocket is displayed which the student may shoot down if problem is solved correctly in time. A student having trouble may get help at any time by pressing the "H" key. Upon completion of problems, a summary performance report is given. Then, the teacher may request a detailed problem-by-problem report. A form to record student progress is included in the documentation.

EVALUATION

COMMENTS

In general, this is an outstanding technical accomplishment. It contains some human engineering deficiencies which should be corrected

The most attractive features include good documentation, great flexibility in tailoring problems to student needs, and excellent user proofing (disabling of irrelevant keys). Also, problems may be worked on screen exactly as they would be on paper. There is a good "Help" facility, and performance reporting is unusually thorough.

The most serious deficiency is in the area of instructions given by program. First of all, a knowledgeable student can't bypass the instructions. However, more serious is the fact that the instructions to the student are confused with the teacher dialog for tailoring a problem session, Furthermore, the teacher dialog is too time consuming if it must be done separately for each student using the program. Perhaps this might be done better using a strand approach which assigns a particular set of problem specifications, to a given position in the strand. Then the teacher could enter a number corresponding to a student's current progress in the strand.

The documentation is better than what is usually provided, but would be better with the inclusion of teaching strategies and more guidelines for use of the program.

CHARACTERISTICS

o Documentation

(++) Includes goals stacement, performance objectives, and operating instructions*. Documentation is written clearly*.

(+) Partially fulfills the need for suggested course/subject/grade levels, suggested teaching strategies, and listing and sample run of program.

(-) Does not include correlation with standard texts, prerequisites for use of the program, and suggested follow-up references/activities.

o Instructions Given to User by Program

(++) Complete instructions are given regarding interacting with the program*.

(+) Instructions regarding the instructional task are fair.

(-) The user may not skip instructions if

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* Good implementation of the feature referred to is considered essential for effective courseware.

WORKING WITH BASIC MULTIPLICATION FACTS

Timed drill on
multiplication facts, 0 - 9.

Mathematics: Arithmetic
Grade Levels: 1 - 6

PET
Summary Rating: 6/10

Supplier: Micro-Ed, P.O. Box 24156, Minneapolis, MN 55424 Tel: 612/926-2292.
Language: BASIC.

Equipment: 8K PET.
Packaging/price: On cassette, $7.95.

FUNCTIONAL DESCRIPTION

Each lesson consists of 15 problems generated randomly except that those answered correctly are not repeated. Also, the learner may choose to drill on multiplying only by a certain number. At the end of each lesson, student performance is reported in terms of: number of problems, errors, and answers given by the computer; response time; total lesson time; and identity of troublesome problems.

EVALUATION

COMMENTS

The following are attractive features of the program: (1) The instructions given by the program include a good outline for teachers (however, the reading and concept level may be too difficult for pupils); (2) the performance report is excellent, as it lists the questions which were not correctly completed; and (3) the graphics are very good, especially large numerals.

The following changes should be incorporated for improved effectiveness: (1) supporting documentation should be provided; (2) provision should be made for the student to correct wrong answers; (3) problems which the student gets wrong should be intentionally re-drilled rather than given on a random basis; (4) the performance report should be somehow "frozen" until the teacher has a chance to see it; (5) provision should be made to recycle for the next student; and (6) the Run/Stop key should be disabled.

Also, provision should be made to allow the teacher to change what is displayed in the performance report depending upon the needs of individual children. Some students may be able to work well when this information is fed back to them, others may not. Only the teacher knows, and he or she should have control over this function.

Two other deficiencies of the program should be corrected. The negative feedback used is more graphic than that given for correct answers. This is questionable pedagogy. Furthermore, the display of elapsed time in the corner of the screen may distract some pupils. Also, some teachers do not feel that children should be timed on multiplication drill.

CHARACTERISTICS

o Documentation

The only supporting documentation provided is a short description of what the program does.

o Instructions Given to User by Program

(++) The user may skip instructions if already known.

(+) Instructions regarding the instructional task are fair. Moderately adequate instructions are given regarding interacting with the program*.

o Student-Computer Dialog

(++) Output is paged. User controls continuing to the next page. Uses correct grammar, spelling, hyphenation, and punctuation*.

(+) Amount of information in each page is fairly approriate. Perceptual impact of information presented is moderately suitable. Output spaced and formatted more or less adequately. Includes fairly suitable provisions for individual needs*. Some use of devices to get and maintain interest. Makes fair use of graphics. Reinforcing responses are more or less adequate. Includes some provisions for giving help if difficulty is encountered*. Deals moderately well with inappropriate entries*. Most required entries are within student capabilities*. More or less suitable reporting of student performance.

(-) Language may not be well suited to

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* Good implementation of the feature referred to is considered essential for effective courseware.

COMPU-MATH FRACTIONS

Mathematics: Fractions
Grade Levels: 4 - 8
Tutorial on LCD's and 4 basic operations on fractions.
Apple
Summary Rating: 8/10

Supplier: Edu-Ware Services, 22222 Sherman Way - Suite 102, Canoga Park, CA 91303
Tel: 213/346-6783.
Language: Applesoft BASIC.
Equipment: 32K Apple with disk drive.
Packaging/price: On disk, $39.95.

FUNCTIONAL DESCRIPTION

Seven programs including a pre-test and tutorials in fractions definitions, common and lowest denominators, addition, subtraction, muliplication, and division. The pre-test is multiple choice with items from all parts of the unit; it ends with a report and recommendation for placement of student within the unit. Tutorials each contain four parts: instructions (optional), introduction to the concepts, supported practice, and unsupported practice. In supported practice, problems are done step-by-step with unlimited items and also trials. In unsupported practice, the program presents a problem, and the student works it by his or her own means and chooses one of four answers for evaluation. If the answer is correct, the program goes on to next problem; otherwise, the program gives the correct answer and goes on; there are 10 problems in each unsupported practice session. A performance report at the end of unsupported practice includes recommendations for further work.

EVALUATION

COMMENTS

One of the best tutorial units we have seen; it could be used for either introductory or remedial purposes. However, it could use something to better maintain student interest. The most attractive features include excellent documentation, good internal instructions, well engineered presentation, good user-proofing, and good use of graphics for instructional cues.

The following items could be improved. The documentatiuon, although much better than what most suppliers provide, does not include suggested grade levels, textbook correlations, or follow-up activities.

The dialog is good in most respects but gets a little monotonous. This could be improved by using color and sound, and by varying the format and responses; some personalization might help. No provisions are included for hints or clarifications. However, the student having trouble may go back and repeat supported practice.

The programs are unstructured and contain few comments. Fortunately, the manual gives some information to facilitate program tailoring.

CHARACTERISTICS

o Documentation

(++) Includes goals statement, performance objectives, description of suggested teaching strategies, and operating instructions*. Documentation is written clearly*.

(+) Partially fulfills the need for suggested course/subject and grade levels.

(-) Does not include correlation with standard texts, prerequisites for use of the program, and suggested follow-up references/activities.

o Instructions Given to User by Program

(++) Adequate instructions are given regarding interacting with the program*, and the instructional task. The user may skip instructions if already known.

o Student-Computer Dialog

(++) Output is paged. User controls continuing to the next page. Perceptual impact of information presented is suitable. Output spaced and formatted well. Language is well suited to most students' reading abilities. Uses correct grammar, spelling, hyphenation, and punctuation*. Student may respond with common symbols and ways of using them. Makes good use of graphics. Reinforcing responses are quite appropriate. Allows a reasonable number of wrong answers. Responds appropriately to excessive wrong answers*. Deals quite well with

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* Good implementation of the feature referred to is considered essential for effective courseware.

FRACTIONS + & –

Mathematics: Fractions
Grade Levels: 4 - 8

Practice adding and
subtracting fractions.

PET
Summary Rating: 7/10

Supplier: Teacher's PET (Glenn Fisher),
1517 Holly St., Berkeley, CA 94703.
Language: BASIC.

Equipment: 8K PET.
Packaging/price: On cassette, $7.95.

FUNCTIONAL DESCRIPTION

The program presents randomly generated problems involving addition and subtraction of fractions. It accepts the final result in two pieces: numerator, then denominator. If the student enters an incorrect result, the program reports this and gives him or her another chance. On a second error, the program gives a short tutorial and then another chance. If the student still doesn't get the right answer, the program displays the answer and goes on to a new problem.

EVALUATION

COMMENTS

This program is more or less adequate, but not very interesting. Its strong point is the tutorial on "renaming" fractions. It could be made more effective by correcting the following deficiencies. The only documentation is a short description of what the program does. The dialog is personalized, but otherwise dull and monotonous; there is no variation in response, humor, or change of pace.

The program does not adjust to individual needs by providing easier or harder problems based on performance. It screens out some irrelevant entries but does not tell the student that they are inappropriate - it merely ignores them. Also, it crashes if a zero is entered, and the Stop Key is not disabled. The program gives periodic performance reports but not a session-end report.

CHARACTERISTICS

o Documentation

(++) Includes goals statement. Documentation is written clearly*.

(-) Does not include suggested course/subject/grade levels, stated performance objectives, suggested teaching strategy, correlation with standard texts, prerequisites for use, operating instructions*, listing and sample run of program, and follow-up references/activities.

o Instructions Given to User by Program

(++) Adequate instructions are given regarding interacting with the program* and regarding the instructional task. The user may skip instructions.

o Student-Computer Dialog

(++) Output is paged. User controls continuing to the next page. Appropriate amount of information in each page. Perceptual impact of information presented is suitable. Output spaced and formatted well. Language is well suited to most students' reading abilities. Uses correct grammar, spelling, hyphenation, and punctuation*. Student may respond with common symbols. Dialog is personalized. Reinforcing responses are appropriate. Allows a reasonable number of wrong answers. Responds appropriately to excessive wrong answers*. Includes good provisions for giving help if difficulty is encountered*. All required entries are within student capabilities*.

(+) Makes moderate use of graphics. Fair reporting of student performance.

(-) Does not provide for individual needs*. Does not use devices to maintain interest. No use of devices to minimize bad entries. Deals poorly with inappropriate entries*.

o Miscellaneous Concerns

(++) Prerequisite concepts and vocabulary are quite reasonable. Operates properly.

(-) Program is not well structured and documented internally.

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* Good implementation of the feature referred to is considered essential for effective courseware.

Evaluative information provided by Dresden Associates.

METRIC ROADRUNNER

Mathematics: Metrication
Grade Levels: 4 - 7

Practice estimating distances in centimeters - game format.

TRS-80
Summary Rating: 7/10

Supplier: Micro Learning Ware, P.O. Box 2134, N. Mankato, MN 56001 Tel: 507/-625-2205.
Language: Level II BASIC.

Equipment: 16K TRS-80 Model I.
Packaging/price: On cassette or disk (TRS); alone $7.95, as one of 7 programs in Math Package II ($24.95).

FUNCTIONAL DESCRIPTION

The program places coyote and roadrunner shapes on the screen in random locations. The student tries to make the coyote "catch" the roadrunner by estimating and typing in the distance between the two shapes as so many centimeters up or down and right or left. If the student misses, the program relocates both shapes, and the student tries again. If he or she estimates correctly, the program gives a vibrating message and the chance to try again.

EVALUATION

COMMENTS

This program is built on a nice idea, and the result is more or less adequate. However, it could be much better if more care were taken in implementing it. The following improvements would make a big difference: (1) more complete documentation (consists of a five-line description of what the program does); (2) allow user control over going between pages; (3) the basic format is interesting for a while, but should be varied, and changing pace and/or surprise could be added; (4) the task could be broken into smaller elements so as to allow progression from easier to harder ones; (5) The amount of error on each trial should be fed back to the student both graphically and numerically to help sharpen estimating skills; and (6) added incentive could be provided by periodic and final score results.

CHARACTERISTICS

o Documentation

(++) Includes goals statement. Documentation is written clearly*.

(-) Does not include suggested course/-subject and grade levels, performance objectives, suggested teaching strategy, correlation with standard texts, prerequisites for use, operating instructions*, listing and sample run of program, and suggested follow-up references/activities.

o Instructions Given to User by Program

(++) Adequate instructions are given regarding the instructional task.

(+) Partial instructions are given regarding interacting with the program*.

o Student-Computer Dialog

(++) Output is paged. Appropriate amount of information in each page. Perceptual impact of information presented is suitable. Output spaced and formatted well. Language is well suited to most students' reading abilities. Uses correct grammar, spelling, hyphenation, and punctuation*. Student may respond with common symbols. Dialog is personalized. Makes good use of devices to maintain interest. Makes good use of graphics. Reinforcing responses are appropriate. Responds appropriately to excessive errors*. Deals well with inappropriate entries*. All required entries are within student capabilities*.

(-) User has limited control over continuing to the next page. Does not provide for individual needs*. Number of errors allowed is unreasonable. Gives no opportunity to get help if difficulty is encountered*. No use of devices to minimize bad entries.

o Miscellaneous Concerns

(++) Prerequisite concepts and vocabulary are quite reasonable. Operates properly*.

(+) Program is fairly well structured and documented internally.

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* Good implementation of the feature referred to is considered essential for effective courseware.

Evaluative information provided by Dresden Associates.

FACTOR

Mathematics: Numeration
Grade Levels: 4 - 7

Practice factoring and identifying primes in game framework.

Apple, TRS-80
Summary Rating: 6/10

Supplier: Micro Learningware, P.O. Box 2134, N. Mankato, MN 56001 Tel: 507/-625-2205.
Language: Applesoft and Level II BASIC.

Equipment: 16K TRS-80 or Apple with recorder, 32K with disk.
Packaging/price: Cassette or disk; $7.95 alone, $24.95 in six-program package.

FUNCTIONAL DESCRIPTION

The program presents a list of ordinal numbers, starting with 1 and ending with number chosen by student. Student and program take turns. On the student's turn, he or she picks a number, trying to get the largest one whose factors remaining in the list have a small sum. The number selected is added to the students score. Then, the Taxman in the program gets the factors of the students number that remain.

EVALUATION

COMMENTS

I like the idea of the game for a student who wants a knowledgeable partner. It was nice to be able to press "anything" to advance to the next page.

The meaning of "factoring" should have been explained (including a few examples) but was not. Also, the program should give some suggestions regarding a strategy for playing the game, especially for players who are having trouble and need help.

CHARACTERISTICS

o Documentation

No supporting documentation is provided.

o Instructions Given to User by Program

(++) Adequate instructions are given regarding the instructional task. Complete instructions are given regarding interacting with the program*. The user may skip instructions if already known.

o Student-Computer Dialog

(++) Output is paged. Appropriate amount of information in each page. Perceptual impact of information presented is suitable. Output spaced and formatted well. Language is well suited to most students' reading abilities. Uses correct grammar, spelling, hyphenation, and punctuation*. Reinforcing responses are quite appropriate. All required entries are within student capabilities*. Good reporting of student performance.

(+) Includes some provisions for individual needs*. Moderate use of devices to get and maintain interest. Deals fairly well with inappropriate entries*.

(-) User has limited control over continuing to the next page. Graphics are not used well. Gives no opportunity to get help if difficulty is encountered*. No use of devices to minimize bad entries.

o Miscellaneous Concerns

(++) Prerequisite concepts and vocabulary are quite reasonable.

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* Good implementation of the feature referred to is considered essential for effective courseware.

Evaluative information provided by
Evelyn Anderson (former teacher), Portland, Maine.

FIND THE FACTORS

Mathematics: Numeration
Grade Levels: 3 - 8

Practice finding two numbers,
given their sum and product.

PET
Summary Rating: 7/10

Supplier: Teacher's PET (Glenn Fisher),
1517 Holly St., Berkeley, CA 94703.
Language: BASIC.

Equipment: 8K PET.
Packaging/price: On cassette, $7.95.

FUNCTIONAL DESCRIPTION

The program gives the sum and product of two numbers; the student tries to find the numbers. If the correct numbers are entered in the first four trials, the program reports correct and presents a new problem. If neither number has been entered, the program gives one of the numbers; the other is given if not found after four more trials. If two numbers are entered which give either the sum or product but not both, the student is so informed. Two difficulty levels are provided: operands 1-10 and 1-100, respectively.

EVALUATION

COMMENTS

This program is built on a good idea, but it could have been carried out better. The most attractive feature is the game format. Including two difficulty levels provides somewhat for individual needs. Also, the single-number hint, and the feedback regarding correct sum or product, are helpful. However, these could well be augmented by including a tutorial on a strategy for finding the missing numbers.

Unfortunately, the program has many drawbacks. The documentation is limited to a short paragraph. The dialog is uninteresting - it includes no graphics, variation of response, humor, etc. Allowing eight trials is poor practice. The user has no control over continuing to the next page. The program does not deal well with inappropriate entries - even letters are not screened out. No performance report is given at session end.

CHARACTERISTICS

o Documentation

(++) Includes goals statement. Documentation is written clearly*.

(-) Does not include suggested course/-subject and grade levels, performance objectives, suggested teaching strategy, correlation with standard texts, prerequisites for use, operating instructions*, listing and sample run of program, and follow-up references/activities.

o Instructions Given to User by Program

(++) Adequate instructions are given regarding interacting with the program* and regarding the instructional task. The user may skip instructions if already known.

o Student-Computer Dialog

(++) Output is paged. Appropriate amount of information in each page. Perceptual impact of information presented is suitable. Output spaced and formatted well. Language is well suited to most students' reading abilities. Uses correct grammar, spelling, hyphenation, and punctuation*. Student may respond with common symbols. Accepts abbreviations for common responses. Dialog is personalized. Reinforcing responses are quite appropriate. Responds appropriately to excessive errors*. Includes good provisions for giving help if difficulty is encountered*. All required entries are within student capabilities*.

(+) Includes some provisions for individual needs*. Fair reporting of student performance.

(-) User has no control over continuing to the next page. Does not use devices maintain interest. No use of of graphics. Number of wrong answers allowed is unreasonable. No use of devices to minmimize bad entries. Deals poorly with inappropriate entries*.

o Miscellaneous Concerns

(++) Prerequisite concepts and vocabulary are quite reasonable. Operates properly.

(+) Program is fairly well structured and documented internally.

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* Good implementation of the feature referred to is considered essential for effective courseware.

Evaluative information provided by Dresden Associates.

PLACE VALUE

Mathematics: Numeration
Grade Levels: 4 - 8

Tutorial on place value in decimal numbers.

Apple ,PET, TRS-80
Summary Rating: 6/10

Supplier: Micro Learningware, P.O. Box 2134, N. Mankato, MN 56001 Tel: 507/-625-2205.
Language: BASIC.

Equipment: 8K PET, 32K Apple/TRS-80, disk.
Packaging/price: On cassette or disk; alone $7.95, as one of several programs in Math Package $24.95.

FUNCTIONAL DESCRIPTION

The program operates as follows: (1) introduces the decimal system and the values of digits in the ones through 1000's places; (2) gives practice in determining the quantity of ones, ten's, etc., making up a number; (3) introduces the relationship between regular and expanded numbers, e.g., 25=(2 x 10) + (5 x 1), and gives practice with this concept; and (4) gives practice (30 items) determining the value of numerals in each place, e.g., what is the value of 5 in 8537? A performance report is given at the end.

EVALUATION

COMMENTS

This tutorial might be fairly adequate for a well motivated student, but it is not very interesting. The only documentation is a seven-line paragraph. The instructions given by the program do not state how to terminate entries. The user has no control over continuing to the next page. The dialog is dull; it contains no variation in response, humor, etc., to maintain interest. Graphics are used only in a limited way. There is not even the incentive of periodic performance reports, only a session-end report.

Problem difficulty levels are not varied to meet individual needs. There are no provisions for providing help or clarification if a student is having difficulty. The tutorial material cannot even be reviewed without rerunning the entire program. Furthermore, there is no attempt to evaluate intermediate results in a problem, e.g., the student is not told which response(s) is in error when giving digit values. Also, only one trial is allowed on each question.

CHARACTERISTICS

o Documentation

(++) Includes goals statement. Documentation is written clearly*.

(-) Does not include suggested course/-subject/grade levels, performance objectives, suggested teaching strategies, correlation with standard texts, prerequisites for use, operating instructions*, listing and sample run of program, and suggested follow-up references/activities.

o Instructions Given to User by Program

(++) Adequate instructions are given regarding the instructional task.

(+) Partial instructions are given regarding interacting with the program*.

o Student-Computer Dialog

(++) Output is paged. Appropriate amount of information in each page. Perceptual impact of information presented is suitable. Output spaced and formatted well. Language is well suited to most students' reading abilities. Uses correct grammar, spelling, hyphenation, and punctuation*. Student may respond with common symbols. Dialog is personalized. Deals well with inappropriate entries*. All required entries are within student capabilities*.

(+) Makes some use of graphics. Reinforcing responses are more or less adequate. Moderate reporting of student performance.

(-) User has limited control over continuing to the next page. Does not provide for individual needs*. Does not use devices to get and maintain interest. Number of wrong answers allowed is unreasonable. Gives no opportunity to get help if difficulty is encountered*. No use of devices to minimize bad entries.

o Miscellaneous Concerns

(++) Prerequisite concepts and vocabulary are quite reasonable. Operates properly*.

(+) Program is fairly well structured and documented internally.

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* Good implementation of the feature referred to is considered essential for effective courseware.

Evaluative information provided by Dresden Associates.

SETS

Mathematics: Numeration
Grade Levels: 4 - 7

Practice finding the union
and intersection of two sets.

PET
Summary Rating: 6/10

Supplier: Tycom Associates, 69 Velma Ave., Pittsfield, MA 01201.
Language: BASIC.

Equipment: 8K PET.
Packaging/price: In Algebra cassette package; seven programs, $19.95.

FUNCTIONAL DESCRIPTION

The program presents two sets consisting of letters and asks for their union and intersection. If the student answers correctly, the program so indicates and goes on to the next question. If the student is not correct the first time, the right answers are given, and the next problem is presented. An optional review lesson is available to introduce or review the set concept. The program reports student performance after 10 problems.

EVALUATION

COMMENTS

This is not a very effective program. Its only redeeming features are good operating instructions, immediate feedback to the student, and the review lesson which could be helpful to a student having difficulty.

Here are the more important deficiencies: (1) inadequate documentation (see below under Characteristics); (2) tightly formatted instructions which are hard to read; uninteresting presentation - no variation in format and responses; (3) no use of graphics; (4) no changes in problem difficulty to meet individual needs; (5) only one chance to get the correct answer; (6) no hints or clarifications, not even giving part of the answer (union or intersection); and (7) poor handling of irrelevant responses.

CHARACTERISTICS

o Documentation

(++) Includes goals statement and operating instructions*. Documentation is written clearly*.

(-) Does not include suggested course/-subject and grade levels, stated performance objectives, suggested teaching strategies, correlation with standard texts, prerequisites for use of the program, listing and sample run of program, and suggested follow-up references/activities.

o Instructions Given to User by Program

(++) Adequate instructions are given regarding interacting with the program* and regarding the instructional task.

(-) The user may not skip instructions if already known.

o Student-Computer Dialog

(++) Output is paged. User controls continuing to the next page. Appropriate amount of information in each page. Perceptual impact of information presented is suitable. Output spaced and formatted well. Language is well suited to most students' reading abilities. Uses correct grammar, spelling, hyphenation, and punctuation*. Student may respond with common symbols and ways of using them. Reinforcing responses are quite appropriate. Responds appropriately to excessive wrong answers*. All required entries are within student capabilities*. Good reporting of student performance.

(+) Includes some provision for giving help if difficulty is encountered*.

(-) Does not provide for individual needs*. Dialog is not personalized. Does not use devices to get and maintain interest. Makes poor use of graphics. Number of wrong answers allowed is unreasonable. No use of devices to minimize bad entries. Deals poorly with inappropriate entries*.

o Miscellaneous Concerns

(++) Prerequisite concepts and vocabulary are quite reasonable. Operates properly and is free of bugs*.

(-) Program is not well structured and documented internally.

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* Good implementation of the feature referred to is considered essential for effective courseware.

Evaluative information provided by Dresden Associates.

SETS AND NUMBERS

Mathematics: Numeration
Grade Levels: 4 - 7

Practice with sets
and number sentences.

TRS-80
Summary Rating: 6/10

Supplier: Micro Learningware, P.O. Box 2134, N. Mankato, MN 56001 Tel: 507/-625-2205.
Language: Level II BASIC.

Equipment: 16K TRS-80 Model I.
Packaging/price: On cassette or disk; alone $7.95; as one of 6 programs in Math Package I, $24.95.

FUNCTIONAL DESCRIPTION

The program presents a scored pre-test followed by optional practice on sets and number sentences. It gives a problem, then accepts a number referring to the answer. If the student answers correctly, the program reports this and gives the next problem. If the student enters an incorrect answer, the program so states and gives the problem again; it allows unlimited trials. There is no performance report except on the pre-test.

EVALUATION

COMMENTS

This is not a very attractive program. In general, it is uninteresting and not very well implemented. The following deficiencies should be corrected: (1) documentation is limited to a five-line description; (2) the instructions do not specify how to terminate input; (3) the user does not have control over going between pages; (4) the same formats are used throughout - even the same problems are given in every session; (5) allowing unlimited trials is poor instructional practice; (6) there is no variation in problem difficulty based on student performance; (7) there is feedback in the form of performance reports; and (8) the program gives no assistance to students having difficulty.

CHARACTERISTICS

o Documentation

(++) Includes goals statement. Documentation is written clearly*.

(-) Does not include suggested course/-subject and grade levels, performance objectives, suggested teaching strategies, correlation with standard texts, prerequisites for use, operating instructions*, listing and sample run of program, and suggested follow-up references/activities.

o Instructions Given to User by Program

(++) Adequate instructions are given regarding the instructional task.

(+) Partial instructions are given regarding interacting with the program*.

o Student-Computer Dialog

(++) Output is paged. Appropriate amount of information in each page. Perceptual impact of information presented is suitable. Output spaced and formatted well. Language is well suited to most students' reading abilities. Uses correct grammar, spelling, hyphenation, and punctuation*. Student may respond with common symbols. Dialog is personalized. Deals well with inappropiate entries*. All required entries are within student capabilities*.

(+) Reinforcing responses are fairly adequate. Makes some use of graphics.

(-) User has limited control over continuing to the next page. Does not provide for individual needs*. Does not use devices to maintain interest. Number of wrong answers allowed is unreasonable. Gives no opportunity to get help if difficulty is encountered*. No use of devices to minimize bad entries. Poor reporting of student performance.

o Miscellaneous Concerns

(++) Prerequisite concepts and vocabulary are quite reasonable. Operates properly*.

(+) Program is fairly well structured and documented internally.

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* Good implementation of the feature referred to is considered essential for effective courseware.

Evaluative information provided by Dresden Associates.

POLUT

Science: Ecology
Grade Levels: 6 - 10

Explores the factors affecting
the quality of a water resource.

PET
Summary Rating: 8/10

Supplier: National Coordinating Center for Curriculum Development, State University of New York, Stony Brook, NY 11794, Tel: 516/246-8418.
Language: BASIC.

Equipment: 8K PET or 32K Pet with disk.
Packaging/price: Individually on cassette, $5; in package of 15 programs, $50. Also on disk.

FUNCTIONAL DESCRIPTION

This simulation program allows students to investigate a body of water undergoing pollution. Several different types of water bodies, from a small pond to a fast-moving stream, may be studied. The program allows students to vary several factors and to see the effects on pollution and dissolved oxygen levels in the water; the factors include temperature, type of pollutant, and type of treatment the pollutant receives before entering the water. Effects are reported in a table, a graph, or both. Documentation (available separately) includes a teacher's guide, a student workbook, and a resource handbook.

EVALUATION

COMMENTS

A good simulation of an experiment not possible in a classroom. A biology teacher said that he liked this program and would use it in his classroom.

CHARACTERISTICS

o Documentation

(++) Includes suggested course/subject and grade levels, goals statement, suggested teaching strategies, student exercises, operating instructions*, listing and sample runs of program, description of the model used, suggested topics for follow-up discussions, and suggested follow-up references/activities. Documentation is written clearly*. The format and content of the included workbook are satisfactory*.

(-) Does not include correlation with standard texts and prerequisites for use of the program.

o Instructions Given to User by Program

(++) Adequate instructions are given regarding the instructional task. Complete instructions are given about interacting with the program*.

(-) The user may not skip instructions if already known.

o Student-Computer Dialog

(++) Output is paged. User controls continuing to the next page. Appropriate amount of information in each page. Perceptual impact of information presented is suitable. Output is spaced and formatted well. Language is well suited to most students' reading abilities. Uses correct grammar, spelling, hyphenation, and punctuation*. The coordinate system used is consistent with common conventions. Student may respond with common symbols and ways of using them. Accepts abbreviations for common responses. All required entries are within student capabilities*.

(+) Makes fair use of graphics.

(-) Does not provide for individual needs*. Dialog is not personalized. Does not use devices to get and maintain interest. No use of devices to minimize bad entries. Does not deal well with inappropriate entries.*

o Miscellaneous Concerns

(++) Gives an accurate representation of the situation simulated. Prerequisite concepts and vocabulary are quite reasonable. Operates properly and is free of bugs*.

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* Good implementation of the feature referred to is considered essential for effective courseware.

Evaluative information provided by Bonnie Turrentine,
Math Teacher, Dedham High School, Dedham, Massachusetts.

POP

Science: Biology, Ecology
Grade Levels: 7 - 12

Students may examine the population dynamics of simple organisms.

PET
Summary Rating: 8/10

Supplier: National Coordinating Center for Curriculum Development, State University of New York, Stony Brook, NY 11794, Tel: 516/246-8418.
Language: BASIC.

Equipment: 8K PET or 32K PET with disk.
Packaging/price: Individually on cassette, $5; in package of 15 programs, $50. Also on disk.

FUNCTIONAL DESCRIPTION

This simulation allows students to investigate three different population growth models: exponential, logistic, and logistic modified for low density. It enables one to explore the effects of reproductive rates, high and low population densities, and initial population size on population growth. The student specifies parameters and then the program graphs population over time. Up to four graphs may be superimposed to permit comparison of effects. Documentation (available separately) includes a teachers guide, a student workbook, and a resource handbook.

EVALUATION

COMMENTS

The program requires a fair knowledge of the numerical data needed to work with a population model. The copy I received contains a minor bug which would be easy to fix if one were a programmer but would be demoralizing if one were not.

CHARACTERISTICS

o Documentation

(++) Includes suggested course/subject and grade levels, goals statement, description of suggested teaching strategies, student exercises and answers, operating instructions*, listing and sample runs of program, description of the model used, suggested topics for follow-up discussions, and suggested follow-up references/activities. Documentation is written clearly*. The format and content of the included workbook are adequate*.

(-) Does not include stated performance objectives, correlation with standard texts, and prerequisites for use of the program.

o Instructions Given to User by Program

(+) Instructions regarding the instructional task are fair. Partial instructions are given regarding interacting with the program*.

(-) The user may not skip instructions if already known.

o Student-Computer Dialog

(++) Output is paged. User controls continuing to the next page. Appropriate amount of information in each page. Perceptual impact of information presented is suitable. Output spaced and formatted well. Uses correct grammar, spelling, hyphenation, and punctuation*. The coordinate system used is consistent with common conventions. Student may respond with common symbols and ways of using them. Provides well for individual needs*. Makes good use of graphics. Good use of devices such as objective formats to minimize bad entries. All required entries are within student capabilities*.

(+) Language is fairly well suited to most students' reading abilities. Accepts some abbreviations for common responses. Moderate use of devices to get and maintain interest.

(-) Dialog is not personalized. Does no deal well with inappropriate entries*.

o Miscellaneous Concerns

(++) Gives an accurate representation of the situation simulated. Prerequisite concepts and vocabulary are reasonable.

(+) Operates fairly well*.

---

* Good implementation of the feature referred to is considered essential for effective courseware.

Evaluative information provided by Bonnie Turrentine,
Math Teacher, Dedham, Massachusetts High School.

WATER

Science: Ecology
Social Studies: Current Problems
Grade Levels: 8 - 10

Student manages water resources in a small town.

PET
Summary Rating: 7/10

Supplier: National Coordinating Center for Curriculum Development, State University of New York, Stony Brook, NY 11794
Tel: 516/246-8418.
Language: BASIC.

Equipment: 8K PET or 32K PET with disk.
Packaging/price: Individually on cassette, $5; in package of 15 programs, $50. Also on disk.

FUNCTIONAL DESCRIPTION

In this simulation, the student manages many factors in a town threatened by imminent drought in order to try to save the town. He or she may enact legislation to curtail water consumption, build treatment plants, redistribute the labor force, decide how much land to irrigate, and adjust the flow of water to other communities downstream. The program reports the resulting condition of the community in terms of availability of food, industrial goods, and water; current population; and budget. The program runs in simulated "real time", i.e., it continues to run and the student must make decisions and type in changes "on the fly".

EVALUATION

COMMENTS

More documentation is necessary in order to understand the program and to use it effectively.

CHARACTERISTICS

o Documentation

The only documentation is a short statement of goals and of what the program does.

o Instructions Given to User by Program

(++) Adequate instructions are given regarding the instructional task. Complete instructions are given regarding interacting with the program*.

(-) The user may not skip instructions if already known.

o Student-Computer Dialog

(++) Output is paged. User controls continuing to the next page. Appropriate amount of information in each page. Perceptual impact of information presented is suitable. Output spaced and formatted well. Language is well suited to most students' reading abilities. Uses correct grammar, spelling, hyphenation, and punctuation*. Student may respond with common symbols and ways of using them. Accepts abbreviations for common responses. All required entries are within student capabilities*.

(+) Some use of devices to get and maintain interest. Makes moderate use of graphics. Includes fair provisions for getting help if difficulty is encountered*. Some reporting of student performance.

(-) Dialog is not personalized. No use of devices to minimize bad entries. Deals poorly with inappropriate entries*.

o Miscellaneous Concerns

(++) Gives an accurate representation of the situation simulated. Prerequisite concepts and vocabulary are quite reasonable. Operates properly and is free of bugs*.

---

* Good implementation of the feature referred to is considered essential for effective courseware.

Evaluative information provided by Bonnie Turrentine,
Math Teacher, Dedham High School, Dedham, Massachusetts.

LINEAR KINEMATICS

Science: Physics
Grade Levels: 10 - 12

Practice problems on velocity, acceleration, and distance.

Apple, PET
Summary Rating: 7/10

Supplier: Microphys, 2048 Ford St., Brooklyn, NY 11229 Tel: 212/646-0140.
Language: BASIC.

Equipment: 8K PET; also available for Apple.
Packaging/price: On tape, $20; also available on diskette.

FUNCTIONAL DESCRIPTION

The program gives several questions regarding velocity, average acceleration, and distance travelled. It also displays a graph. The student answers the questions from the graph or from his or her own computations. If an answer is incorrect once, the program either tells the student to check the graph or gives the relevant formula. On a second error, it displays the formula, computations, and final answer, then goes on to the next question.

EVALUATION

COMMENTS

This program is more or less effective. Its best features are the graph it generates for study, the formula cue, and showing the correct computations after a second error. It could be improved by correcting the deficiencies listed here: (1) inadequate documentation; (2) no variation in response, change of pace, etc., to maintain interest; (3) no change of problem difficulty or format to adapt to individual needs; (4) no use objective answers to minimize typographical errors; and (5) no periodic reporting of performance. Also, it seems that more should be done with graphics to help the student understand some of the concepts involved, e.g., acceleration.

CHARACTERISTICS

o Documentation

(++) Includes goals statement. Documentation is written clearly*.

(-) Does not include suggested course/-subject and grade levels, performance objectives, suggested teaching strategies, correlation with standard texts, prerequisites for use, operating instructions*, listing and sample run of program, and suggested follow-up discussion topics and references/activities.

o Instructions Given to User by Program

(++) Adequate instructions are given regarding interacting with the program* and regarding the instructional task.

(-) The user may not skip instructions.

o Student-Computer Dialog

(++) Output is paged. User controls continuing to the next page. Appropriate amount of information in each page. Perceptual impact of information presented is suitable. Output spaced and formatted well. Language is well suited to most students' reading abilities. Uses correct grammar, spelling, hyphenation, and punctuation*. Student may respond with commom symbols. Accepts abbreviations for commom responses. Reinforcing responses are appropriate. Allows a reasonable number of errors. Responds appropriately to excessive errors*. Includes good provisions for giving help if difficulty is encountered*. Deals well with inappropriate entries*. All required entries are within student capabilities*.

(+) Makes fair use of graphics. More or less adequate reporting of student performance.

(-) Does not provide for individual needs*. Dialog is not personalized. Does not use devices to maintain interest. No use of devices to minimize bad entries.

o Miscellaneous Concerns

(++) Prerequisite concepts and vocabulary are quite reasonable. Operates properly*.

(-) Program is not well structured and documented internally.

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* Good implementation of the feature referred to is considered essential for effective courseware.

Evaluative information provided by Dresden Associates.

FOREIGN CAPITALS

Social Studies: Geography
Grade Levels: 7 - 10

Practice matching countries and their capital cities.

TRS-80
Summary Rating: 5/10

Supplier: Jensen Software, 1589 Blossom Park, Lakewood, OH 44107.
Language: Level II BASIC.

Equipment: 16K TRS-80 Model I.
Packaging/price: On cassette, $9.95.

FUNCTIONAL DESCRIPTION

The program displays a numbered list of 50 countries on the screen, then prints the name of a capital city at the bottom. The student enters the number of the country whose capital is shown. If he or she is correct, the program presents a new capital. If not, the student continues to try (unlimited trials). There are two options: (1) All countries remain displayed throughout a session; and (2) those correctly matched with a city are removed. Performance is reported after all countries are correctly matched.

EVALUATION

COMMENTS

This program doesn't do anything that couldn't be done just as well with lists of countries and capitals on paper. Its only strong points are that it is easy to use and provides immediate feedback. Its deficiencies are extensive, including: documentation limited to a six-line paragraph; it is difficult to locate the countries because they are alphabetized in rows rather than columns; allowing unlimited trials is poor pedagogy; there is no way to get help if needed; and there is no filtering of irrelevant entries.

CHARACTERISTICS

o Documentation

(++) Includes goals statement and operating instructions*. Documentation is written clearly*.

(-) Does not include suggested course/-subject and grade levels, stated performance objectives, suggested teaching strategies, correlation with standard texts, prerequisites for use of the program, listing and sample run of program, suggested follow-up discussion topics, and suggested follow-up references/activities.

o Instructions Given to User by Program

(++) Adequate instructions are given regarding the instructional task.

(+) Partial instructions are given regarding interacting with the program*.

o Student-Computer Dialog

(++) Language is well suited to most students' reading abilities. Student may respond with common symbols and ways of using them. Accepts abbreviations for common responses. Reinforcing responses are quite appropriate. Good use of devices such as objective formats to minimize bad entries. All required entries are within student capabilities*.

(+) Uses mostly correct grammar, spelling, hyphenation, and punctuation*. Fair reporting of student performance.

(-) Output spaced and formatted poorly. Does not provide for individual needs*. Dialog is not personalized. Does not use devices to get and maintain interest. Makes poor use of graphics. Number of wrong answers allowed is unreasonable. Gives no opportunity to get help if difficulty is encountered*. Deals poorly with inappropriate entries*.

o Miscellaneous Concerns

(++) Prerequisite concepts and vocabulary are quite reasonable. Operates properly and is free of bugs*.

(-) Program is not well structured and documented internally.

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* Good implementation of the feature referred to is considered essential for effective courseware.

Evaluative information provided by Dresden Associates.

STATE GUESS

Social Studies: Geography
Grade Levels: 5 - 10

Reviews state geographic facts in fun format.

TRS-80
Summary Rating: 7/10

Supplier: Basics and Beyond, P.O. Box 10, Amawalk, NY 10501 Tel: 914/962-2355.
Language: Level II BASIC.

Equipment: 16K TRS-80 Model I or III.
Packaging/price: One of 20 programs in cassette package Microcosm II, $24.95.

FUNCTIONAL DESCRIPTION

The student chooses a state and then answers questions about it posed by the program. The program then identifies the state. If the identification is correct (i.e., the student was able to answer the questions correctly), the session is over. If not, the program asks for the state's name. Then, the computer will either identify the problem as a spelling error (says it never heard of that state) or as an incorrect answer to one of the questions asked previously by the program; this ends the run.

EVALUATION

COMMENTS

I like this program; it could help anyone learn more about each state. It was apparently designed for home use but could be used well in school situations.

There were a few things about the program that especially need improvement. The instructions given by the program are fairly adequate. However, when the program shows a list of all the states, I think they should be listed alphabetically.

Even minor typing errors (e.g., two spaces between North and Dakota) cause an answer to be evaluated as wrong. This would be quite discouraging when one had correctly identified a state. It is probably a mistake to try to require both identification and correct spelling in the same exercise. Perhaps it would be better to allow answers in multiple choice format.

Because this program is fun, I would like to see suggestions on follow-up activities, games or references to encourage continuation of this as a learning project. Perhaps students could invent such games/activities if this was stated and a few ideas were suggested.

CHARACTERISTICS

o Documentation

(++) Includes goals statement and operating instructions*. Documentation is written clearly*.

(-) Does not include suggested course/-subject, grade levels, stated performance objectives, suggested teaching strategies, correlation with standard texts, prerequisites for use of the program, student exercises and answers, listing and sample run of program, suggested follow-up discussion topics and references/activities.

o Instructions Given to User by Program

(++) Adequate instructions are given regarding the instructional task and interacting with the program. The user may skip instructions if already known.

o Student-Computer Dialog

(++) Output is paged. Appropriate amount of information in each page. Perceptual impact of information presented is suitable. Output spaced and formatted well. Language is well suited to most students' reading abilities. Uses correct grammar, spelling, hyphenation, and punctuation*. Provides well for individual needs*. Reinforcing responses are quite appropriate. All required entries are within student capabilities*.

(+) Some use of devices to get and maintain interest. Deals fairly well with inappropriate entries*.

(-) User has limited control over continuing to the next page. Does not accept abbreviations for common responses. Dialog is not personalized. Makes no use of graphics. Gives no opportunity to get help if difficulty is encountered*. Poor reporting of student performance.

o Miscellaneous Concerns

(++) Prerequisite concepts and vocabulary are quite reasonable. Operates properly and is free of bugs*.

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* Good implementation of the feature referred to is considered essential for effective courseware.

Evaluative information provided by
Evelyn Anderson (former teacher), Portland, Maine.

NEW WORLD EXPLORERS

Social Studies: History,
Geography
Science: General Science
Grade Levels: 9 - 12

Simulates early explorer's
trip to a new world.

TRS-80, others
Summary Rating: 9/10

Supplier: McGraw-Hill, 1221 Ave. of the Americas, New York, NY, Tel: 212/997-1221.
Language: Level II BASIC.

Equipment: Will be on TRS-80 and several others.
Price: Expected to be about $150 when released in second half, 1981.

FUNCTIONAL DESCRIPTION

New World Explorers is a simulation of an early explorer's voyage to a new world. The class is divided into teams which work cooperatively, making daily navigation decisions and mapping out the world they discover.

Each team's goal is to discover and map out a new world and to return home safely. Each one takes charge of a boat and must make daily navigation and exploration decisions based on information provided by the computer. The children are effectively projected into the world of the early explorers and must use knowledge provided in the accompanying booklets to integrate a wealth of information provided by the computer at each turn. They must keep track and learn the significance of things such as ocean depths, the position of other boats, the weather, trade winds, foodstuff, and water. Brave explorers can attempt to circumnavigate the world.

Beyond the simulation experience itself, children develop skills in mapping, compass angles, determining latitude and longitude, careful recordkeeping, and the coordination of a great deal of information as they work through the program.

EVALUATION

COMMENTS

This is an exciting and highly imaginative program that allows an entire class, with the use of only one computer, to become involved in a cooperative and challenging series of tasks. It is a good example of what is possible if someone has a vision about what the capabilities of a computer are. New World Explorers will be part of a new simulation collection called The Search Series. The other programs look equally as good.

The program itself does not include provisions for individual needs. However, since players work as a team, easier and harder tasks can be divided at this level. Therefore, such provisions are not necessary in the program. New World Explorers is designed so that it will not accept inappropriate answers. The result of a poor choice is losing ground in the exploration.

The program does not contain provisions for giving help if difficulty is encountered. However, careful design and use in a group situation make this unnecessary. Student performance rather, than being monitored by the program, is charted by the students themselves.

o Documentation

(++) Includes suggested course/subject and grade levels, goals statement, suggested teaching strategies, student exercises, operating instructions*, listing and sample runs of programs, and suggested topics for follow-up discussions. Documentation is written clearly*. The format and content of the included workbook are adequate*.

(+) Partially fulfills the need for stated performance objectives.

(-) Does not include: Correlation with standard texts, prerequisites for use of the program, and suggested follow-up references/activities.

o Instructions Given to User by Program

(++) Adequate instructions are given regarding the instructional task.

o Student-Computer Dialog

(++) Output is paged. User controls continuing to the next page. Appropriate amount of information in each page. Perceptual impact of information presented is suitable. Output spaced and formatted well. Language is well suited to most students' reading abilities. Uses correct grammar, spelling, hyphenation, and punctuation*. The coordinate system used is consistent with common conventions. Student may respond with common symbols

(continued on page 54)

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* Good implementation of the feature referred to is considered essential for effective courseware.

COMPU-READ (continued from page 10)

spelling, hyphenation, and punctuation*. Deals fairly well with inappropriate entries*.

(-) Dialog is not personalized. Does not use devices to maintain interest. Makes poor use of graphics, color, and sound. No use of devices to minimize bad entries.

o Miscellaneous Concerns

(++) Prerequisite concepts and vocabulary are quite reasonable. Operate properly*.

(+) Programs are fairly well structured and documented internally.

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* Good implementation of the feature referred to is considered essential for effective courseware.

Evaluative information provided by Dresden Associates.

……

WORD FAMILIES (continued from page 17)

(+) Includes some provisions for individual needs*. Dialog is partially personalized.

(-) Does not use devices to get and maintain interest. Poor use of sound. Gives no opportunity to get help if difficulty is encountered*.

o Miscellaneous Concerns

(++) Prerequisite concepts and vocabulary are quite reasonable. Operates properly and is free of bugs*. Program is well structured and documented internally.

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* Good implementation of the feature referred to is considered essential for effective courseware.

Evaluative information provided by Dresden Associates.

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ALGEBRA BILLIARDS (continued from page 25)

answers. Responds appropriately to excessive wrong answers*. Includes good provisions for giving help if difficulty is encountered*. Deals quite well with inappropriate entries*. All required entries are within student capabilities*. Good reporting of student performance.

(+) Some provisions for individual needs*.

o Miscellaneous Concerns

(++) Prerequisite concepts and vocabulary are quite reasonable. Operates properly and is free of bugs*.

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* Good implementation of the feature referred to is considered essential for effective courseware.

Evaluative information provided by
Evelyn Anderson (former teacher), Portland, Maine.

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MATH PAK I (continued from page 30)

Allows a fairly reasonable number of wrong answers. More or less adequate reporting of student performance.

(-) Gives no opportunity to get help if difficulty is encountered*. Deals poorly with inappropriate entries*.

o Miscellaneous Concerns

(++) Prerequisite concepts and vocabulary are quite reasonable. Operates properly.*.

(+) Program is fairly well structured and documented internally.

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* Good implementation of the feature referred to is considered essential for effective courseware.

Evaluative information provided by Dresden Associates.

INTRODUCTION TO MATHEMATICS ON THE COMPUTER (continued from page 28)

Uses correct grammar, spelling, hyphenation, and punctuation*. Provides well for individual needs*. Dialog is personalized. Reinforcing responses are appropriate. Responds appropriately to excessive errors*. Good use of devices such as objective formats to minimize bad entries. All required entries are within student capabilities*.

(+) Language is fairly well suited to most students' reading abilities. Some use of devices to get and maintain interest. Includes moderate provisions for giving help if difficulty is encountered*. Fair reporting of student performance.

(-) User has limited control over continuing to the next page. Student may not respond with common symbols or ways of using them. Makes poor use of graphics. Number of wrong answers allowed is unreasonable. Deals poorly with inappropriate entries*.

o Miscellaneous Concerns

(++) Prerequisite concepts and vocabulary are quite reasonable. Operates properly*.

(+) Program is fairly well structured and documented internally.

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* Good implementation of the feature referred to is considered essential for effective courseware.

Evaluative information provided by Dresden Associates.

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LEGACY (continued from page 29)

spelling, hyphenation, and punctuation*. The coordinate system used is consistent with common conventions. Student may respond with common symbols and ways of using them. Good use of sound. Reinforcing responses are quite appropriate. Allows a reasonable number of wrong answers. Deals quite well with inappropriate entries*. All required entries are within student capabilities*.

(+) Amount of information in each page is fairly appropriate. Makes fair use of graphics. Responds fairly well to excessive wrong answers*.

(-) Does not provide for individual needs*. Does not use devices to get and maintain interest. Color is not used well. Gives no opportunity to get help if difficulty is encountered*.

o Miscellaneous Concerns

(++) Prerequisite concepts and vocabulary are quite reasonable. Operates properly and is free of bugs*. Program is well structured and documented internally.

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* Good implementation of the feature referred to is considered essential for effective courseware.

Evaluative information provided by
Dresden Associates.

……

COMPU-MATH FRACTIONS (continued from page 37)

inappropriate entries*. All required entries are within student capabilities*. Good reporting of student performance.

(+) Amount of information in each page is more or less appropriate. Includes fair provisions for giving help if difficulty is encountered*.

(-) Does not provide for individual needs*. Dialog is not personalized. Does not use devices to get and maintain interest. Color and sound are not used well.

o Miscellaneous Concerns

(++) Prerequisite concepts and vocabulary are quite reasonable. Operates properly and is free of bugs*.

(+) Program is fairly well structured and documented internally.

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* Good implementation of the feature referred to is considered essential for effective courseware.

Evaluative information provided by Dresden Associates.

WHOLE NUMBER ARITHMETIC SERIES (continued from page 35)

already known.

o Student-Computer Dialog

(++) Output is paged. User controls continuing to the next page. Appropriate amount of information in each page. Perceptual impact of information presented is suitable. Output spaced and formatted well. Language is well suited to most students' reading abilities. Uses correct grammar, spelling, hyphenation, and punctuation*. Student may respond with common symbols and ways of using them. Makes good use of graphics. Reinforcing responses are quite appropriate. Allows a reasonable number of wrong answers. Responds appropriately to excessive wrong answers*. Includes good provisions for giving help if difficulty is encountered*. Deals quite well with inappropriate entries*. All required entries are within student capabilities*. Good reporting of student performance.

(+) Includes more or less adequate provisions for individual needs*. Some use of devices to get and maintain interest.

(-) Dialog is not personalized.

o Miscellaneous Concerns

(++) Prerequisite concepts and vocabulary are quite reasonable. Operates properly and is free of bugs*.

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* Good implementation of the feature referred to is considered essential for effective courseware.

Evaluative information provided by Dresden Associates.

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READINGS IN LITERATURE (continued from page 9)

grammar, spelling, hyphenation, and punctuation*. Makes good use of graphics, color, and sound. Reinforcing responses are quite appropriate. Allows a reasonable number of wrong answers. Responds appropriately to excessive wrong answers*. Includes good provisions for giving help if difficulty is encountered*. All required entries are within student capabilities*.

(+) Includes some provisions for individual needs*. Some use of devices to get and maintain interest. Deals fairly well with inappropriate entries*. Fair reporting of student performance.

(-) Dialog is not personalized.

o Miscellaneous Concerns

(++) Prerequisite concepts and vocabulary are quite reasonable. Operates properly and is free of bugs*.

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* Good implementation of the feature referred to is considered essential for effective courseware.

Evaluative information provided by
Dresden Associates.

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NEW WORLD EXPLORERS (continued from page 51)

and ways of using them. Makes good use of graphics. Reinforcing responses are quite appropriate. Good use of devices such as objective formats to minimize bad entries. Deals quite well with inappropriate entries*. All required entries are within student capabilities*.

(+) Includes some provisions for individual needs*. Some use of devices to get and maintain interest.

o Miscellaneous Concerns

(++) Gives an accurate representation of the situation simulated. Prerequisite concepts and vocabulary are quite reasonable. Operates properly and is free of bugs*.

(-) Program is not well structured and documented internally.

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* Good implementation of the feature referred to is considered essential for effective courseware.

Evaluative information provided by
Richard Carter, Lecturer, Lesley College, Cambridge, Massachusetts.

INDEX TO REVIEWS IN OTHER OTHER PUBLICATIONS

As far as we know, the following is the most comprehensive listing ever published of reviews of microcomputer instructional software contained in magazines and journals. If comprises 287 references to reviews which appeared over the past two years in some of the most widely read periodicals in the field (these are listed with their addresses following the index). This listing will be updated for each edition of SMW REVIEWS.

A few brief explanatory notes are in order. The list is sequenced alphabetically by product name. Each entry includes product name, name of supplier, hardware system(s) for which the product is supplied (some authors may not have stated all systems), the publication and issue in which the review appeared, the author(s), and the approximate length of the review in words. The last item is intended to give a gross estimate of the amount of detail included in a given review. This item also contains an indication of illustrations (coded "i") and tables (coded "t") included as part of the review referred to. Also, if more than one product was included in a review, the total number is shown as a divisor to the approximate number of words. For example, 1000/3 means 1000 words describing three products.

PRODUCT NAME	SUPPLIER	SYSTEM	PUBLICATION	ISSUE	PAGE	AUTHOR(S)	APPRX WDS
Acid-Base Chemistry	Prog's for Learn'g	PET	Purser's Magazine	Sprg80	15	Purser	240
Add	Cursor #8	PET	Computing Teacher	2,3/80	45	Isaacson	415
Add	Cursor #8	PET	MACUL Journal	V3 #1	1	Winebrener	185
Add with Carry	Creative Computing	Apple	MACUL Journal	V3 #1	2	Winebrener	139
Addn, Subt, Multn, Divn.	Educat'l Micro Sys	TRS-80	Computing Teacher	V8 #3	20	Snyder & Zinter	670/4
Aerodynamics	CLOAD (8/79)	TRS-80	MACUL Journal	V3 #1	3	Winebrener	106
Alcohol	Creative Computing	Apple	MACUL Journal	V3 #1	6	Winebrener	172
Algebra	George Earl	Apple	Purser's Magazine	Sumr80	45	Purser	155+i
Algebra	Tycom Associates	PET	Creative Computing	1/81	38	Lubar	175/3
Algebra 1	Radio Shack	TRS-80	Creative Computing	3/79	58	Heuer	250
Algebra Billiards	Curric Applicat'ns	TRS-80	Computing Teacher	V8 #6	60	Isaacson	690
Alpha Syntauri Music	Alpha Syntauri Ltd	Apple	Creative Computing	10/80	28	Lubar	335
Apple Integer Basic	Apple Computer Co.	Apple	Creative Computing	7/80	28		Chart
Apple PASCAL	Apple Computer Co.	Apple	Creative Computing	12/80	43	North	1230/2
Apple Speller	Hartley Software	Apple	Purser's Magazine	Sprg80	25	Purser	335
Apple Writer	Apple Computer Co.	Apple	Personal Computing	1/81	26	Jong	5530+t/8
Apple Writer	Apple Computer Co.	Apple	Purser's Magazine	Sprg80	40	Purser	1240
Apple Writer	Apple Computer Co.	Apple	Purser's Magazine	Sumr80	18	Purser	960/2
Apple-Lis'ner	Softape	Apple	MACUL Journal	V3 #1	7	Winebrener	240
Apple-Talker	Softape	Apple	MACUL Journal	V3 #1	8	Winebrener	295
Applelodian II	Hit Enterprises	Apple	Creative Computing	2/79	100	Milewski	215
Applesoft	Apple Computer Co.	Apple	Creative Computing	7/80	28		Chart
Applesoft II	Apple Computer Co.	Apple	Creative Computing	12/80	70	Firebaugh et al	2815+t/5
Arabic/English	Multi Micro Media	Apple	Purser's Magazine	Wntr80	14	Purser	185+i
Area Under A Curve	Math Software	Apple	Math Teacher	4/81	298	Kepner	255/13
Aristotle Apple	Stoneware Microcmp	Apple	Creative Computing	10/80	56	Lubar	310+i
Arithmetic Drill	Advanced Graphics	TRS-80	MACUL Journal	V3 #1	9	Winebrener	315
Arithmetic of Functions	Math Software	Apple	Math Teacher	4/81	298	Kepner	255/13
Aromatic	Dr Richard F Daley	PET	MACUL Journal	V3 #1	10	Winebrener	195
Astro Quotes	Program Design Inc	App/PET/TRS	Creative Computing	10/80	58	Lubar	55+i/3
Atari BASIC	Atari Inc.	Atari	Creative Computing	7/80	28		Chart
Auto Scribe	Microsource	Apple/TRS80	Creative Computing	1/80	24	Sellier	470+i,t
BOHR Atom	Univ. of Mich.	PET	MACUL Journal	V3 #1	15	Winebrener	15
BOP (Chisanbop)	Cursor #4	PET	MACUL Journal	V3 #1	16	Winebrener	95
Bar (Graph)	Cursor #3	PET	MACUL Journal	V3 #1	11	Winebrener	130
Basic Instruction Course	Radio Shack	TRS-80	MACUL Journal	V3 #1	12	Winebrener	170
Basic Math Skills Games	Software Factory	PET	Purser's Magazine	Wntr80	29	Purser	140+i
Beginning Russian	Instant Software	TRS-80	Purser's Magazine	Sumr80	27	Purser	135+i
Binary Tree	Cload Magazine9/79	TRS-80	Purser's Magazine	Wntr80	43	Purser	50+i
Binomial Multiplication	Math Software	Apple	Math Teacher	4/81	298	Kepner	255/13
Biology Series	J & S Software	Apple	Creative Computing	1/81	38	Lubar	145/2
Buffalo	Creative Computing	TRS-80	MACUL Journal	V3 #1	18	Winebrener	150
Bulls and Bears	Speakeasy Software	PET	MACUL Journal	V3 #1	19	Winebrener	195
CAI Tutorial	Sterling Swift	TRS80 Apple	Purser's Magazine	Wntr80	52	Purser	525+i
CMC Word Processor	Conn Microcomputer	PET	Creative Computing	3/81	26	Greenberg	1195
Caiware	Fireside Computing	TRS-80	Purser's Magazine	Sprg80	10	Coyne	715
Chem Lab Simulations	Conduit	PET	Creative Computing	1/81	36	Lubar	110
Chemistry Series	J & S Software	Apple	Creative Computing	1/81	38	Lubar	145/2
Cheque-Check	Micro Software Sys	PET	MACUL Journal	V3 #1	21	Winebrener	150
Circle	Cursor #9	PET	MACUL Journal	V3 #1	22	Winebrener	215
Circulation	Micro Power&Light	Apple	Creative Computing	10/80	56	Lubar	210+i
Clock	Hartley Software	Apple	Purser's Magazine	Sprg80	13	Purser	60
Color Math	Apple Computer Co.	Apple	MACUL Journal	V3 #1	23	Winebrener	160
Compak 1	Compak, Inc.	Apple	Creative Computing	1/81	38	Lubar	195
Compu-Math Fractions	Edu-Ware Services	Apple	Purser's Magazine	Sumr80	29	Purser	270+i
Compu-Read	Edu-Ware Services	Apple	Creative Computing	9/80	56	Bejar	1580/4
Computer Doodle	Steketee Ed Softwe	Apple	Creative Computing	9/80	66	Lubar	200/2
Computer Literacy	Creative Computing	Apple	MACUL Journal	V3 #1	[illegible]	Winebrener	270
Constellation	Cybermate	TRS-80	Purser's Magazine	Fall79	[illegible]	Purser	165+i
Constellation	Cybermate	TRS-80	Purser's Magazine	Wntr80	48	Purser	140+i

INDEX TO REVIEWS IN OTHER PUBLICATIONS

PRODUCT NAME	SUPPLIER	SYSTEM	PUBLICATION	ISSUE	PAGE	AUTHOR(S)	APPRX WDS
Constellation	Cload Magazine	TRS-80	Purser's Magazine	Wntr80	49	Purser	80+i
Crossbow	Hayden Book Co.	PET	Computing Teacher	6,7/80	38	Ryoti	940/2
Curvplot	MTS Enterprises	TRS-80	80 Microcomputing	2/81	15	Spangenberg	260
Darts	Creative Computing	PET	Computing Teacher	2,3/80	45	Isaacson	290/2
Darts	Creative Computing	PET	MACUL Journal	V3 #1	25	Winebrener	270
Division	Dr Richard F Daley	PET	MACUL Journal	V3 #1	27	Winebrener	170
Dow Jones	Instant Software	PET	MACUL Journal	V3 #1	29	Winebrener	160
Draw	Creative Computing	PET	MACUL Journal	V3 #1	30	Winebrener	195
Dynatext Editor	James Strasma	PET	Micro	5/80	24	Rowe	90
EST (Estimate)	Cursor #2	PET	MACUL Journal	V3 #1	34	Winebrener	160
Easy Writer	Info. Unlimited	Apple	Creative Computing	10/80	34	Ahl	925
Easy Writer	Info. Unlimited	Apple	Creative Computing	7/80	16	Glorer	1980+t/2
Easy Writer	Info. Unlimited	Apple	Personal Computing	1/81	26	Jong	5530+t/8
Easy Writer	Info. Unlimited	Apple	Purser's Magazine	Sumr80	14	Purser	1010
Ecological Simulations	Conduit	Apple	Creative Computing	1/81	36	Lubar	95
Ecology Simulations 1	Creative Computing	TRS-80	Creative Computing	5/81	218	Gray	755+i
Ecology Simulations 1	Creative Computing	TRS-80	Purser's Magazine	Fall79	40	Purser	375+i
Electric Pencil	Shrayer Software	TRS-80 CP/M	Creative Computing	2/79	30	Craig	2160
Electric Pencil	Shrayer Software	TRS-80	Purser's Magazine	Sumr80	18	Purser	960/2
Electric Pencil II	Shrayer Software	CP/M	Personal Computing	1/81	26	Jong	5530+t/8
Elementary Math	Muse Software	Apple	Purser's Magazine	Sumr80	38	Purser	155+i
Elementary Math Edu-Disk	Muse Software	Apple	Creative Computing	10/80	56	Lubar	180+i
Elementary Math Pkgs 1/2	Micro Learningware	TRS-80	Creative Computing	10/80	58	Lubar	55
Engine	Apple Computer Co.	Apple	MACUL Journal	V3 #1	32	Winebrener	115
FORTRAN-80	Microsoft	TRS-80	Creative Computing	1/79	62	Hogg	
Factoring Whole Numbers	Quality Ed Designs	Apple TRS80	Computing Teacher	V8 #4	41	Wagner&Isaacson	390+t/2
Finance	Cursor #10	PET	MACUL Journal	V3 #1	36	Winebrener	75
Financier	Instant Software	PET	MACUL Journal	V3 #1	37	Winebrener	160
Flash Spelling	Educat'l Activit's	PET TRS-80	Creative Computing	9/80	68	Lubar	90
Flash Spelling	Educat'l Activit's	PET	Computing Teacher	V8 #1	20	Isaacson	370
Flash/Cards	Cursor #3	PET	MACUL Journal	V3 #1	38	Winebrener	215
Frac/Mixd Num Arthimetic	Educat'l Micro Sys	TRS-80	Computing Teacher	V8 #3	20	Snyder & Zinter	670/4
Fractions	Quality Ed Designs	Apple TRS80	Computing Teacher	V8 #4	41	Wagner&Isaacson	390+t/2
French	Tycom Associates	PET	Creative Computing	1/81	38	Lubar	175/3
Fund Skills for Gen Chem	Prog for Learning	PET	Purser's Magazine	Sprg80	21	Purser	145
Gauss!	Cursor #12	PET	MACUL Journal	V3 #1	41	Winebrener	270
Gauss!	Cursor #12	PET	Purser's Magazine	Wntr80	16	Purser	370+i
Grade Averages	Educat'l Activit's	PET	Computing Teacher	V8 #2	40	Isaacson	325+i
Gram-Molecular Mass PC23	Microphys	PET	Purser's Magazine	Sprg80	21	Purser	95
Grammar Package I	Micro Learningware	TRS-80	Creative Computing	10/80	58	Lubar	95
Graphic Integra'n Theory	Math Software	Apple	Math Teacher	4/81	298	Kepner	255/13
Guess the Rule	Steketee Ed Softwe	Apple	Creative Computing	9/80	66	Lubar	280/2
Guess the Rule	Steketee Ed Softwe	Apple TRS80	Computing Teacher	V8 #6	59	Isaacson	220
Guitar Chords 2 (SJ-002)	En-Joy Comptr Comp	TRS-80	Purser's Magazine	Wntr80	26	Purser	600+i
Ham Package	Instant Software	TRS-80	MACUL Journal	V3 #1	42	Winebrener	140
Hamurabi	Peninsula Schools	PET	MACUL Journal	V3 #1	43	Winebrener	185
Hands	Peninsula Schools	PET	MACUL Journal	V3 #1	44	Winebrener	140
Hangman	Dr Richard F Daley	PET	MACUL Journal	V3 #1	45	Winebrener	115
Hangman	Atari, Inc.	Atari	Purser's Magazine	Sumr80	15	Jymann	155+i
Hman (Hangman)	Cursor #5	PET	MACUL Journal	V3 #1	47	Winebrener	130
Human Adventure	Med Systems Softwe	TRS-80	The S-Eighty	9/80	22	Taylor	1165/2
Hurkle	MECC Publications	Apple	Computing Teacher	4,5/80	59	Underwood	190/2
IQ Builder	Program Design Inc	Apple/PET	Creative Computing	5/79	70	Heuer	1510
IQ Builder	Program Design Inc	Apple	MACUL Journal	V3 #1	48	Winebrener	185/2
Individual Study Center	TYC Software	TRS80 Apple	Creative Computing	10/80	58	Lubar	210
Intro Math on Computer	Educat'l Activit's	TRS-80	Creative Computing	9/80	68	Lubar	220
Intro To Microcomputers	Mentor Software	TRS-80	Purser's Magazine	Sumr80	49	Seter	265+i
Invitation to Prog'g	Atari, Inc.	Atari	Purser's Magazine	Sumr80	35	Jymann	210+i
K-8 Math Package	Radio Shack	TRS-80	Creative Computing	9/80	102	Potts	310
K-8 Math Program	Radio Shack	TRS-80	80 Microcomputing	2/81	16	Petrakos	930
K-8 Math Program	Radio Shack	TRS-80	Creative Computing	10/80	59	Lubar	225
KIS Music Editor	American Micro Pro	Apple	Creative Computing	10/80	26	Lubar	205+i
Kinetics	Univ. of Mich.	PET	MACUL Journal	V3 #1	49	Winebrener	185
Kingdom	Dr Richard F Daley	PET	MACUL Journal	V3 #1	50	Winebrener	160
Kingdom	Atari, Inc.	Atari	Purser's Magazine	Sumr80	39	Jymann	205
Lenses and Mirrors	Commodore Bus Mach	PET	MACUL Journal	V3 #1	51	Winebrener	185
Level 1 BASIC Course	Radio Shack	TRS-80	Creative Computing	1/79	28	Gray	
Life Expectancy	Creative Computing	Apple	MACUL Journal	V3 #1	52	Winebrener	130
Limacons & Their Areas	Math Software	Apple	Math Teacher	4/81	295	Kepner	255/13
Limits of Sequences	Math Software	Apple	Math Teacher	4/81	298	Kepner	255/13
Logic and Deduction	Educat'l Micro Sys	TRS-80	Computing Teacher	V8 #3	20	Snyder & Zinter	670/4
Long Division	Microcmptr Wrkshop	PET	Computing Teacher	V8 #2	40	Isaacson	365
MAD	Cursor #2	PET	MACUL Journal	V3 #1	53	Winebrener	130
Malaria	Creative Computing	App/Ata/TRS	Creative Computing	10/80	42	Lubar	1015+i
Market	Dr Richard F Daley	PET	MACUL Journal	V3 #1	54	Winebrener	160

INDEX TO REVIEWS IN OTHER PUBLICATIONS

PRODUCT NAME	SUPPLIER	SYSTEM	PUBLICATION	ISSUE	PAGE	AUTHOR(S)	APPRX WDS
Master Lesson Program	Carta Associates	TRS-80	Purser's Magazine	Sprg80	12	Fraser	525
Math	Dr Richard F Daley	PET	MACUL Journal	V3 #1	56	Winebrener	130
Math 1	Radio Shack	TRS-80	Creative Computing	3/79	58	Heuer	380
Math Drill	Creative Computing	Apple	MACUL Journal	V3 #1	57	Winebrener	150
Math Pak I, Math Pak II	Eduware	TRS-80	Computing Teacher	6,7/80	35	Moursund	940/2
Mayday	Hayden Book Co.	PET	MACUL Journal	V3 #1	58	Winebrener	305
Medit	TIS	PET	Compute	1,2/80	29	Lindsay	4250/3
Melodious Dictator	Micro Music, Inc.	Apple	Creative Computing	10/80	29	Lubar	260+i
Memory Bldr Concentrat'n	Program Design Inc	Apple	MACUL Journal	V3 #1	59	Winebrener	195
Metric/Engl Conversion	Educat'l Micro Sys	TRS-80	Computing Teacher	V8 #3	20	Snyder & Zinter	670/4
Micro Focus COBOL	Micro Focus Ltd.	TRS-80	Creative Computing	3/80	20	McClure	5445+t/2
Micro Music	Radio Shack	TRS-80	Creative Computing	1/80	34	Wright	735+i
Micro Technology Music	Micro Tech Unltd.	PET	Creative Computing	10/80	28	Lubar	360
Microphys Progs (in gen)	Microphys	PET	Creative Computing	9/80	192	Yob	270
Microphys Progs (in gen)	Microphys	PET	Purser's Magazine	Wntr80	30	Purser	560+i
Microsoft BASIC	Microsoft	Many	Creative Computing	12/80	70	Firebaugh et al	2815+t/5
Microsoft COBOL	Microsoft	TRS-80	Creative Computing	3/80	20	McClure	5445+t/2
Microtyping	Hayden Book Co.	TRS-80	Creative Computing	4/80	132	Gray	810
Microtyping	Hayden Book Co.	TRS-80	Purser's Magazine	Fall79	71	Purser	65+i
Midpoint&Trapezodl Rules	Math Software	Apple	Math Teacher	4/81	298	Kepner	255/13
Milliken Math Sequences	Milliken Pub Co.	Apple	Creative Computing	9/80	56	Bejar	1580/4
Mind-Memory Improvement	(TYC) Software	TRS80 Apple	Creative Computing	6/80	28	Gorson	1720
Minicrossword	Program Design Inc	TRS-80	Purser's Magazine	Wntr80	37	Purser	140+i
Mole Concept	Commodore Bus Mach	PET	MACUL Journal	V3 #1	60	Winebrener	160
Momentum and Energy	Commodore Bus Mach	PET	MACUL Journal	V3 #1	61	Winebrener	160
Money Master	Med Systems Softwe	TRS-80	80 Microcomputing	2/81	18	Taylor	505
Mul-ti-Sound	Innovative Penguin	TRS-80	Computing Teacher	V8 #3	21	Rogers	225
Music Box	New Engl Electr'cs	PET	MACUL Journal	V3 #1	62	Winebrener	305
Music Composer	Atari, Inc.	Atari	Creative Computing	4/81	28	Zinn & Zinn	1390
Music Composer	Atari, Inc.	Atari	Creative Computing	1/81	26	Hasman	905
Music Composer	Atari, Inc.	Atari	Purser's Magazine	Sumr80	34	Jymann	380+i
Music Composer/Editor	PFDC Software	TRS-80	Purser's Magazine	Sprg80	23	Purser	285
Music Reading	Cove View Press	TRS-80	Purser's Magazine	Sprg80	33	Purser	95
Music Synthesizer	Alf Products, Inc.	Apple	Creative Computing	6/79	102	North	1465+i,t
Music System	Mountain Hardware	Apple	Creative Computing	10/80	26	Lubar	445+i
Music System	Mountain Hardware	Apple	Compute	1/81	60	Harrell	835
Musicraft Developm't Sys	Computercraft	CP/M	Creative Computing	10/80	49	Hart	1660+i
Names	Peninsula Schools	PET	MACUL Journal	V3 #1	63	Winebrener	150
Naming Alkene Compounds	Dr Richard F Daley	PET	Purser's Magazine	Sprg80	32	Purser	475
Naming Compounds Drill	Commodore Bus Mach	PET	MACUL Journal	V3 #1	66	Winebrener	195
Neeco's Music Box	New Engl Electr'cs	PET	Creative Computing	6/80	52	Hobson	580+t
ODELL 1	MECC Publications	Apple	Computing Teacher	4,5/80	59	Underwood	190/2
Orbital Motion	Conduit	Apple	Purser's Magazine	Sumr80	23	Purser	205+i
Organ	Micropute Software	TRS-80	Creative Computing	9/80	188	Gray	505+i
Oxidation-Reduction	Dr. William Butler	PET	Purser's Magazine	Sprg80	16	Purser	240
PET BASIC	Commodore Bus Mach	PET	Creative Computing	12/80	70	Firebaugh et al	2815+t/5
PET BASIC	Commodore Bus Mach	PET	Creative Computing	7/80	28		Chart
PET PILOT	PET Pilot Project	PET	Kilobaud Microcmptg	6/80	8	Baker	1295
PIE/FORMAT	Programma Intern'l	Apple	Personal Computing	1/81	26	Jong	5530+t/8
Perception	Edu-Ware Services	Apple	Creative Computing	9/80	56	Bejar	1580/4
Personal Text Processor	Charles Mann	Apple	Purser's Magazine	Sprg80	43	Purser	335
Personal Weight Control	Instant Software	PET	MACUL Journal	V3 #1	70	Winebrener	130
Photo	Peter Ashley	TRS-80	Purser's Magazine	Wntr80	36	Purser	230+i
Photo	Petsoft	PET	Purser's Magazine	Wntr80	38	Purser	1185+i
Plant Competition	Conduit	Apple	Purser's Magazine	Sumr80	45	Purser	180+i
Playful Professor	Med Systems Softwe	TRS-80	The S-Eighty	9/80	22	Taylor	1165/2
Plot	Steketee Ed Softwe	Apple	Creative Computing	9/80	66	Lubar	280/2
Plot	Steketee Ed Softwe	Apple TRS80	Computing Teacher	V8 #6	59	Isaacson	310
Plot	Cursor #1	PET	MACUL Journal	V3 #1	71	Winebrener	75
Polar Graphing	Math Software	Apple	Math Teacher	4/81	298	Kepner	255/13
Pop	Creative Computing	TRS-80	MACUL Journal	V3 #1	72	Winebrener	205
Projectile Motion Analys	Commodore Bus Mach	PET	MACUL Journal	V3 #1	73	Winebrener	73
Rational Funct'n Grapher	Math Software	Apple	Math Teacher	4/81	298	Kepner	255/13
Readability Index	Educat'l Activit's	PET TRS-80	Computing Teacher	V8 #5	42	Isaacson	430+i
Readings in Literature	George Earl	Apple	Purser's Magazine	Sprg80	17	Purser	285
Redox	Univ. of Mich.	PET	MACUL Journal	V3 #1	75	Winebrener	130
Roman Numerals	Advanced Graphics	TRS-80	MACUL Journal	V3 #1	77	Winebrener	95
Round the Horn	TRS-80 Softwe Exch	TRS-80	MACUL Journal	V3 #1	79	Winebrener	170
Ruler	Cursor Magazine	PET	Purser's Magazine	Sprg80	11	Purser	145
Santa Paravia&Fiumaccio	Instant Software	TRS-80	MACUL Journal	V3 #1	80	Winebrener	160
Scattering	Conduit	Apple	Purser's Magazine	Sumr80	41	Purser	240+i
Scramble	Programma Intern'l	Apple	MACUL Journal	V3 #1	81	Winebrener	170
Scrambled Letters	Educat'l Activit's	TRS-80 PET	Creative Computing	9/80	68	Lubar	95
Scrambled Letters	Educat'l Activit's	PET TRS-80	Computing Teacher	V8 #2	39		260
Scripsit	Radio Shack	TRS-80	Personal Computing	1/81	26	Jong	5530+t/8

INDEX TO REVIEWS IN OTHER PUBLICATIONS

PRODUCT NAME	SUPPLIER	SYSTEM	PUBLICATION	ISSUE	PAGE	AUTHOR(S)	APPRX WDS
Scripsit	Radio Shack	TRS-80	Purser's Magazine	Sumr80	12	Purser	710+i
Series/Parallel Circuit	Commodore Bus Mach	PET	MACUL Journal	V3 #1	82	Winebrener	150
Sex Role Test	Creative Computing	Apple	MACUL Journal	V3 #1	83	Winebrener	150
Show and Spell	Radio Shack	TRS-80	Creative Computing	3/81	22	Bejar	1065+i
Simulated Computer	Staketee Ed Softwe	Apple	Creative Computing	9/80	66	Lubar	200/2
Sine & Cosine Grapher	Math Software	Apple	Math Teacher	4/81	298	Kepner	255/13
Snoopy	Creative Computing	PET	MACUL Journal	V3 #1	86	Winebrener	185
Solids of Revolution	Math Software	Apple	Math Teacher	4/81	298	Kepner	255/13
Solv'g Simult Linear Sys	Math Software	Apple	Math Teacher	4/81	298	Kepner	255/13
Spanish	George Earl	Apple	Computing Teacher	V8 #4	42	Isaacson	345+i
Speed Drill	Staketee Ed Softwe	TRS-80	Computing Teacher	V8 #5	43	Isaacson	480
Spell-Bound	Robert Baker	TRS-80	Purser's Magazine	Fall79	52	Purser	155+i
Spelling	Dr Richard F Daley	PET	MACUL Journal	V3 #1	88	Winebrener	195
Spelling 1	Software Factory	TRS-80	Purser's Magazine	Wntr80	12	Purser	325+i
Spelling Bee	Advanced Graphics	TRS-80	MACUL Journal	V3 #1	89	Winebrener	225
Spelling Builder	Program Design Inc	App/PET/TRS	Creative Computing	10/80	59	Lubar	365+i/3
Spelling Builder	Program Design Inc	TRS-80	Purser's Magazine	Fall79	44	Purser	355+i
State Capitals	Advanced Graphics	TRS-80	MACUL Journal	V3 #1	91	Winebrener	140
States	Cursor #11	PET	MACUL Journal	V3 #1	92	Winebrener	170
States and Capitals	Atari, Inc.	Atari	Creative Computing	9/80	70	Lubar	75
Statistics	Edu-Ware Services	Apple	Creative Computing	9/80	56	Bejar	1580/4
Step by Step	Program Design Inc	Apple	MACUL Journal	V3 #1	93	Winebrener	185
Stereo Chemistry	Dr Richard F Daley	PET	Purser's Magazine	Sprg80	59	Purser	145
Sterl	Creative Computing	TRS-80	MACUL Journal	V3 #1	94	Winebrener	205
Story Builder	Program Design Inc	Apple	MACUL Journal	V3 #1	95	Winebrener	240/2
Suffixes	Program Design Inc	App/PET/TRS	Creative Computing	10/80	59	Lubar	365+i/3
Sungraph	Solartex	TRS-80	Purser's Magazine	Fall79	46	Purser	140+i
Sunsim	Solartex	TRS-80	Purser's Magazine	Wntr80	20	Purser	370+i
Super-Text	Muse Software	Apple	Creative Computing	7/80	16	Glorer	1980+t/2
Super-Text	Muse Software	Apple	Personal Computing	1/81	26	Jong	5530+t/8
Super-Text	Muse Software	Apple	Purser's Magazine	Sprg80	37	Purser	1950
Super-Text	Muse Software	Apple	InfoWorld	9/29/0	15	Carpenter	905+t
Synonym (Antonym)	Dr Richard F Daley	PET	MACUL Journal	V3 #1	97	Winebrener	150
TRS-80 DOS BASIC	Radio Shack	TRS-80	Creative Computing	7/80	28		Chart
TRS-80 Level II BASIC	Radio Shack	TRS-80	Creative Computing	12/80	70	Firebaugh et al	2815+t/5
TRS-80 Level II BASIC	Radio Shack	TRS-80	Creative Computing	7/80	28		Chart
Tag	Creative Computing	TRS-80	MACUL Journal	V3 #1	98	Winebrener	240
Taipan	Cybernautics		Kilobaud Microcmptg	2/81	10	Koetke	420/2
Talk & Teach Gr Classics	Atari, Inc.	Atari	Creative Computing	9/80	68	Lubar	410+i/3
Talk & Teach Gr Classics	Atari, Inc.	Atari	Creative Computing	9/80	180	Blank	1020/2
Talk & Teach History	Atari, Inc.	Atari	Creative Computing	9/80	68	Lubar	410+i/3
Talk & Teach Sociology	Atari, Inc.	Atari	Creative Computing	9/80	68	Lubar	410+i/3
Talk&Teach Superv Skills	Atari, Inc.	Atari	Creative Computing	9/80	180	Blank	1020/2
Taylor's Series	Math Software	Apple	Math Teacher	4/81	298	Kepner	255/13
Teacher	Instant Software	TRS-80	Purser's Magazine	Sumr80	28	Purser	385+i
Tennis Anyone?	Data Command	Apple	Creative Computing	1/81	38	Lubar	195
Text	TRS-80Mthy Newsltr	TRS-80	MACUL Journal	V3 #1	101	Winebrener	370
Text Editor	Periphr'ls Un'lmtd	Apple	Creative Computing	5/79	46	Hunter	840
Textcast	Textcast	PET	Compute	1,2/80	29	Lindsay	4250/3
Textcast	Cognitive Products	PET	Purser's Magazine	Wntr80	56	Purser	295
Three Blend	Moundsview Pub Sch	PET	Computing Teacher	V8 #1	22	Ketchum	195
Three Mile Island	Muse Software	Apple	Computing Teacher	V8 #2	39	Moursund	410
Titrate	Cursor #10	PET	MACUL Journal	V3 #1	103	Winebrener	115
Titration	Univ. of Mich.	PET	MACUL Journal	V3 #1	104	Winebrener	240
Typing Tutor	Microsoft	TRS-80	80 Microcomputing	2/81	21	Adcock	590
Typing Tutor	Microsoft	Apple TRS80	Purser's Magazine	Sumr80	46	Latter	730+i
U-Draw II	Muse Software	Apple	Purser's Magazine	Sprg80	55	Purser	240
U. S. Map	Creative Computing	Apple	MACUL Journal	V3 #1	106	Winebrener	150
UCSD PASCAL	Univ Cal San Diego	Apple	Creative Computing	12/80	43	North	1230/2
Uncle Sam's Jigsaw	Muse Software	Apple	MACUL Journal	V3 #1	107	Winebrener	360
Vector Addition Program	Radio Shack	TRS-80	80 Microcomputing	2/81	18	Shooshan	450
Verbal Prob VI-Geometry	Microphys	PET	Computing Teacher	V8 #5	42	Isaacson	385
Visible Music Monitor	AB Computers	PET	Compute	1/81	110	Hunkins	715
Vocab	Tycom Associates	PET	Creative Computing	1/81	38	Lubar	175/3
Vocabulary Builder	Program Design Inc	Apple	MACUL Journal	V3 #1	48	Winebrener	185/2
Vocabulary Builder 2	Program Design Inc	Apple	MACUL Journal	V3 #1	108	Winebrener	205
Voice Plot	Heuristics	Apple	MACUL Journal	V3 #1	110	Winebrener	150
WP Daisy	Dynabyte Inc.	CP/M	Creative Computing	5/79	36	Hamilton	95
Westward	Software Exchange		Kilobaud Microcmptg	2/81	10	Koetke	420/2
Which Stands For Nothing	Peninsula Schools	PET	MACUL Journal	V3 #1	113	Winebrener	170
Word Families	Hartley Software	Apple	Creative Computing	3/81	20	Lubar	180
Word Master	Program Design Inc	Apple	MACUL Journal	V3 #1	95	Winebrener	240/2
Word Master	MicroPro Interna'l	CP/M	Info World	12/80	17	Lucas	1155
Word Processing Program	Conn MicroComputer	PET	Personal Computing	1/81	26	Jong	5530+t/8
Word Processing Program	Conn MicroComputer	PET	Purser's Magazine	Fall79	28	Purser	460+i

INDEX TO REVIEWS IN OTHER PUBLICATIONS

PRODUCT NAME	SUPPLIER	SYSTEM	PUBLICATION	ISSUE	PAGE	AUTHOR(S)	APPRX WDS
Word Processor III	Commodore Bus Mach	PET	Compute	1,2/80	29	Lindsay	4250/3
Word Relationships	Krell Software	App/PET/TRS	Creative Computing	3/81	20	Lubar	205
Word-4	Micro Architect	TRS-80	Personal Computing	1/81	26	Jong	5530+t/8
Wordpro 1	Profess'nl Softwre	PET	Creative Computing	3/81	26	Greenberg	1195
Wordwatch	Instant Software	TRS-80	Purser's Magazine	Sprg80	14	Purser	200

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SUBSCRIPTION ADDRESSES FOR PERIODICALS CITED IN THE INDEX SECTION

80 Microcomputing
80 Pine Street
Peterborough, NH 03458

Compute Magazine
P.O. Box 5406
Greensboro, NC 27403

The Computing Teacher, Computing
Center, E. Oregon State College
La Grande, OR 97850

Creative Computing
P.O. Box 789-M
Morristown, NJ 07960

Info World
375 Cochituate Road
Framingham, MA 01701

Kilobaud Microcomputing
80 Pine Street
Peterborough, NH 03458

MACUL Journal, c/o Lary Smith, WCISD
33500 Van Born Road
Wayne, MI 48184

The Mathematics Teacher
1906 Association Drive
Reston, VA 22091

Micro
P.O. Box 6502
Chelmsford, MA 01824

Personal Computing
50 Essex Street
Rochelle Park, NJ 07662

Purser's Magazine
P.O. Box 466
El Dorado, CA 95623

The S-Eighty
6 South Street
Milford, NH 03055

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USER SOFTWARE REVIEW PROGRAM

As we indicated in the Introduction, we believe that improving software quality is essential to the success of educational computing and that the steps necessary for bringing about this improvement are well known. However, taking those steps will require enormous resources. Several agencies are working on the problem but have only scratched the surface.

This is where SCHOOL MICROWARE and its readers come in. Because there are so many of us, we can accomplish a really big job with only a limited amount of individual effort and expense - and get a lot in return! Here's what we propose: An SMW reader gets one or more instructional programs. He or she reviews the program(s) and evaluates it using the form provided here (copying as necessary), and forwards the completed form(s) to Dresden Associates. We will edit and publish the evaluations in an edition of SMW REVIEWS. (Dresden Associates, of course, reserves the right to accept or reject individual evaluations, based on their merits and the criteria stated below.)

If the contributor is an SMW DIRECTORY subscriber, or has purchased an edition of SMW REVIEWS, he or she will receive at least one free copy of SMW REVIEWS for each evaluation published. Nonsubscribers also may take part in the program and will receive a 50 per cent discount on the $20 retail price of one REVIEWS volume. The bottom line is that SMW readers can get inexpensive access to the evaluative information that is so essential to our field. We urge SMW subscribers to tell their associates about this program and to invite their participation. The more evaluations we have, the better SMW REVIEWS will be.

ON SELECTING SOFTWARE FOR REVIEW

First, we would prefer that programs be for the Apple, Atari, PET, TI-99/4, or the TRS-80 Model I/III. Second, a product selected for review should be either an independent, free-standing program or an entire system of integrated programs. However, it should not be only one member of an operationally integrated set.

For example, several companies offer disk-oriented sets of programs to teach all aspects of a given broad topic, e.g., decimals. Programs may be included to pre-test; to tutor several sub-topics such as addition, conversion, and percentage; to record and report performance; and to coordinate the operation of the entire set. These programs are integrated, not only by topic, but also in an operational sense. That is, it is difficult or impossible to run one of them without having others available in the computer at the same time. It would be desirable to review the entire set (on one or more forms), but not just a single program, as the latter does not give a complete and accurate picture of the entire product. Subscribers whose evaluations of integrated program sets are published will receive three free copies of Reviews to compensate them for the added expense and time required for this job.

On the other hand, most suppliers offer multiple-program packages, which must be purchased as a single unit, but which consist of several programs which can and do operate independently, i.e., not more than one of them needs to be available for any given one to run. Each of these programs is a suitable candidate for evaluation, assuming that it meets the other criteria stated here.

You have a better chance of getting your evaluation published if the product is not one that is likely to be reviewed for this project by several other persons. Evaluating a program two or three times is OK - in fact is preferred - but any more than that is probably a waste of time. We will not publish more than two reviews of the same product unless an additional one offers some very unusual and useful insights. Please contact us by mail or phone (207/737-4466) if you need guidance with regard to selecting a product to evaluate.

THE EVALUATION FORM

Our form has been used successfully by many persons but has not been validated. Therefore, it is not offered as a finished product but as one which we can improve as we go along. Please feel free to make suggestions. Instructions for use of the form are included in it. We have found that it takes from 30 minutes to an hour to do a complete evaluation of one program.

SUBMITTING EVALUATONS

Completed evaluation forms should be mailed to Dresden Associates, P.O. Box 246, Dresden, ME 04342. Deadlines for mailing evaluations to be used in SMW REVIEWS are October 31 and April 30 for the Winter and Summer editions, respectively.

SCHOOL MICROWARE EVALUATION FORM

(COPY AS NEEDED)

Your Name________________________ Organization____________________________ Position__________

Address____ Tel:________________

Product Name____________________ Supplier__________________ Price $________ No. of Progs. Under This Name_____

School Departments to Which Applicable____

INSTRUCTIONS - For open ended items, supply all information requested in blanks provided if possible; use extra sheets if necessary. For objective items (those with blanks to left), enter a number in the blank to indicate the extent to which the program fulfills the description in the item, as follows: 2 - Completely, 1 - Partially, 0 - Not at All. If the item is not applicable to the program, enter N/A. If the item is unclear, enter U. Elaborate on answers as necessary in Comments section at end or on extra sheets, giving item numbers.

FUNCTIONAL DESCRIPTION - Describe the program briefly in terms of its goals and what it does to achieve them (no evaluation here).

____

____

____

PRELIMINARY CONSIDERATION - Assuming that this program contributes to the teaching of one or more topics, is that topic one which is or should be taught in today's schools?___Yes___No If not, give your reasons for this answer in the Comments section at the end of the form and omit the balance of the questionnaire.

DOCUMENTATION - List materials accompanying the program, e.g., teachers guide, student workbook.

1. Indicate types of information included.
   - ----- a. Suggested course/subject, grade levels.
   - ----- b. Goals.
   - ----- c. Performance objectives.
   - ----- d. Suggested teaching strateg(ies).
   - ----- e. Correlation with standard texts.
   - ----- f. Prerequisites for use of program.
   - ----- g. Student exercises, teacher answers.
   - ----- h. Operating instructions.
   - ----- i. Listing and sample runs of program(s).
   - ----- j. If a simulation, description of the model used.
   - ----- k. Suggested topics for follow-up discussions.
   - ----- l. Suggested references/activities for follow-up.

----- 2. The documentation is written clearly.

----- 3. If a workbook is included, the format and content are appropriate.

INSTRUCTIONS GIVEN TO USER BY PROGRAM

1. The instructions are adequate regarding:
   - ----- a. The instructional task to be performed.
   - ----- b. Details of how to interact with the program.

----- 2. User has the option of skipping instructions if already known.

STUDENT-COMPUTER DIALOG

----- 1. Output is displayed screen by screen (paged) rather than scrolled.

2. If output is paged:
   - ----- a. User has control over continuing to the next page.
   - ----- b. Amount of information in each page is appropriate.
   - ----- c. The perceptual impact (amount of type and lines) is suitable.

----- 3. Output is spaced and formatted so as to be easily readable.

----- 4. Language is well suited to most students' reading ability.

----- 5. Uses correct grammar, spelling, hyphenation and punctuation.

----- 6. Any grid or coordinate system used is consistent with common conventions.

----- 7. Students can respond with common symbols & ways of using them, e.g., right to left entry of sums.

----- 8. Accepts abbreviations for common responses.

----- 9. Provides for individual needs, e.g., opportunity to work with harder or easier material.

----- 10. Dialog is personalized, i.e., makes appropriate use of student names.

----- 11. Uses devices to get & maintain interest, e.g., variation of computer responses, humor, pace change, surprise.

12. Makes good use of any special features of computer:

a. Graphics b. Color c. Sound

----- ----- -----

----- 13. Reinforcing responses (indications of right, wrong, etc.) are appropriate.

----- 14. The number of wrong answers allowed is reasonable.

----- 15. Responds appropriately if allowed number of wrong answers is exceeded.

----- 16. Provides opportunity to get help if difficulty is encountered.

----- 17. Minimizes bad entries via devices such as objective formats (multiple choice, etc).

----- 18. Deals well with inappropriate entries, i.e., response to typing errors, etc., is intelligible and useful.

----- 19. Required entries are within students' capabilities (esp. typing, vocabulary).

----- 20. Reports student performance periodically and at end of session.

MISCELLANEOUS CONCERNS

----- 1. If a simulation, the program gives a sufficiently accurate representation of the situation simulated.

----- 2. The concepts and vocabulary required to use the program are reasonable.

----- 3. Operates properly and is free of bugs.

----- 4. Is well structured and documented internally to facilitate any necessary debugging/modification.

COMMENTS - Please use this space and additional sheets as necessary to provide any other information which you believe would help someone who was considering acquiring the program being reviewed. In particular, indicate what you like least and most about the program. Also, list any changes which should be made.)

____

____

Revised 7/81

APPENDIX A. COMPUTATION OF SUMMARY RATINGS

The procedure used to compute the numerical summary ratings assigned to each product reviewed in this volume is somewhat complicated. Before describing that procedure, a few words of background are in order.

First, it is important to understand the use of the evaluation forms from which the reviews were developed. You will note that instructions for the form (see next page) call for assigning a rating of 0, 1, or 2 to each understandable and applicable item on the form to indicate the degree to which a product fulfills the criterion described in the evaluation item. Inapplicable and unclear items are indicated by the codes N (not applicable) and U, respectively.

The 0,1, and 2 ratings also correspond to the (++), (+), and (-) categories used in the reviews. For purposes of the 1 to 10 scale used in the summary ratings, the 0, 1, and 2 values are translated to 1, 5.5, and 10, respectively.

The second matter of concern is the system of weights assigned to each item on the form. It is apparent that not all matters touched on by the form are equally important and that the items need to be weighted to reflect these differences in relative importance. However, we at Dresden Associates did not want to be the sole arbiters of what these weights should be. Therefore, we asked a group of four educators with a great deal of experience in educational computing (a total of 32 years among them) to rate the importance of each item on the form using a scale of 1 to 5 (5 as highest). These ratings were averaged and are shown to the left of each item on the following form. They are used to weight the items in the computation of summary ratings.

And now to the matter of computing the summary ratings themselves. This operation is done by a computer program in accordance with the following procedure:

(1) Add 1 to each item rating assigned by the evaluator, omitting N and U items, so as to have all non-zero ratings in the range 1 to 3.

(2) Multiply each item rating by the weight for that item.

(3) Add separately: (a) the weighted ratings for items under Documentation; (b) the weighted ratings for non-Documentation items; (c) the weights for the Documentation items; and (d) the weights for the non-Documentation items.

(4) Divide the two sums of the weighted ratings by the respective sums of the weights.

(5) Multiply the weighted average for Documentation by .25, the weighted average for all other items by .75.

(6) Scale up the two weighted averages from the 1-3 range to a 1-10 range (0, 1, and 2 become, respectively, 1, 5.5, and 10).

(7) Add the two results obtained in (6).

(8) Round off to the nearest whole number. The result is the Summary Rating.

Note that step (5) places a relative importance of 3 to 1 between program-related (non-documentation) concerns and the supporting documentation. This is an arbitrary decision which assigns a fairly heavy weight to documentation, but one with which we feel quite comfortable. Good supporting documentation is essential to the effective use of software in our schools.

SCHOOL MICROWARE EVALUATION FORM

(This form may be copied as needed; for additional information, see School MicroWare Vol. 1 No. 1)

Your Name __________ Organization __________ Position __________

Product Name __________ Supplier __________ No. of Progs. Under This Name ______ Price $ __________

Applicable School Dept/Subj/Topic __________

INSTRUCTIONS - For open ended items, supply all information requested in blanks provided if possible; use extra sheets if necessary. For objective items (those with blanks to left), enter a number in the blank to indicate the extent to which the program fulfills the description in the item, as follows: 2 - Completely, 1 - Partially, 0 - Not at All. If the item is not applicable to the program, enter N/A. If the item is unclear, enter U. Elaborate on answers as necessary in Comments section at end or on extra sheets, giving item numbers.

OVERVIEW - Describe the program briefly in terms of its goals and what it does to achieve them (no evaluation here).

PRELIMINARY CONSIDERATION - Assuming that this program contributes to the teaching of one or more topics, is that topic one which is or should be taught in today's schools? Yes No If not, give your reasons for this answer in the Comments section at the end of the form and omit the balance of the questionnaire.

DOCUMENTATION - List materials accompanying the program, e.g., teachers guide, student workbook.

1. Indicate types of information included.
3.2 a. Suggested course/subject, grade levels.
4.0 b. Goals.
3.0 c. Performance objectives.
3.0 d. Suggested teaching strateg(ies).
1.5 e. Correlation with standard texts.
3.3 f. Prerequisites for use of program.
3.2 g. Student exercises, teacher answers.
4.7 h. Operating instructions.
3.5 i. Listing and sample runs of program(s).
3.8 j. If a simulation, description of the model used.
3.0 k. Suggested topics for follow-up discussions.
2.0 l. Suggested references/activities for follow-up.
4.5 2. The documentation is written clearly.
4.7 3. If a workbook is included, the format and content are appropriate.

INSTRUCTIONS GIVEN TO USER BY PROGRAM

1. The instructions are adequate regarding:
4.2 a. The instructional task to be performed.
5.0 b. Details of how to interact with the program.
3.5 2. User has the option of skipping instructions if already known.

STUDENT-COMPUTER DIALOG

4.3 1. Output is displayed screen by screen (paged) rather than scrolled.
2. If output is paged:
3.5 a. User has control over continuing to the next page.
4.0 b. Amount of information in each page is appropriate.
3.8 c. The perceptual impact (amount of type and lines) is suitable.
4.3 3. Output is spaced and formatted so as to be easily readable.
4.3 4. Language is well suited to most students' reading ability.
4.5 5. Uses correct grammar, spelling, hyphenation and punctuation.
3.7 6. Any grid or coordinate system used is consistent with common conventions.
3.8 7. Students can respond with common symbols & ways of using them, e.g., right to left entry of sums.
2.5 8. Accepts abbreviations for common responses.
4.5 9. Provides for individual needs, e.g., opportunity to work with harder or easier material.
3.0 10. Dialog is personalized, i.e., makes appropriate use of student names.
4.0 11. Uses devices to get & maintain interest, e.g., variation of computer responses, humor, pace change, surprise.
12. Makes good use of any special features of computer:
4.3 a. Graphics
3.7 b. Color
3.2 c. Sound
4.3 13. Reinforcing responses (indications of right, wrong, etc.) are appropriate.
4.2 14. The number of wrong answers allowed is reasonable.
4.5 15. Responds appropriately if allowed number of wrong answers is exceeded.
4.8 16. Provides opportunity to get help if difficulty is encountered.
3.3 17. Minimizes bad entries via devices such as objective formats (multiple choice, etc).
4.5 18. Deals well with inappropriate entries, i.e., response to typing errors, etc., is intelligible and useful.
4.8 19. Required entries are within students' capabilities (esp. typing, vocabulary).
4.0 20. Reports student performance periodically and at end of session.

MISCELLANEOUS CONCERNS

4.3 1. If a simulation, the program gives a sufficiently accurate representation of the situation simulated.
4.3 2. The concepts and vocabulary required to use the program are reasonable.
5.0 3. Operates properly and is free of bugs.
3.2 4. Is well structured and documented internally to facilitate any necessary debugging/modification.

COMMENTS - Please use this space and additional sheets as necessary to provide any other information which you believe would help someone who was considering acquiring the program being reviewed. In particular, indicate what you like least and most about the program. Also, list any changes which should be made.)